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Cosmic Dust Catalog

Volume 13

Particles from Collectors L2005 and L2011

Space and Life Sciences Directorate
Solar System Exploration Division
Office of the Curator #86

Compliled by:

Cosmic Dust Preliminary Examination Team (CDPET)

September 1992

NASA

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

COSMIC DUST CATALOG

Volume 13

Particles from Collectors L2005 and L2011

Compiled by

Cosmic Dust Preliminary Examination Team (CDPET)*

NASA/Johnson Space Center
Houston, Texas 77058 U.S.A.

September 1992

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INTRODUCTION

Since May 1981, the National Aeronautics and Space Administration (NASA) has used aircraft to collect cosmic dust (CD) particles from Earth's stratosphere. Specially designed dust collectors are prepared for flight and processed after flight in an ultraclean (Class-100) laboratory constructed for this purpose at the Lyndon B. Johnson Space Center (JSC) in Houston, Texas. Particles are individually retrieved from the collectors, examined and cataloged, and then made available to the scientific community for research. Cosmic dust thereby joins lunar samples and meteorites as an additional source of extraterrestrial materials for scientific study.

This catalog summarizes preliminary observations on 328 particles retrieved from collection surfaces L2005 and L2011 (previous particles from collector L2005 were described in Cosmic Dust Catalog 11 & 12). These surfaces were flat plate Large Area Collectors (with a 300 cm^2 surface area each) which was coated with silicone oil (dimethyl siloxane) and then flown aboard a NASA ER-2 aircraft during a series of flights that were made within west-central North America during the fall of 1989. These collectors were installed in a specially constructed wing pylon which ensured that the necessary level of cleanliness was maintained between periods of active sampling. During successive periods of high altitude (20 km) cruise, the collectors were exposed in the stratosphere by barometric controls and then retracted into sealed storage containers prior to descent. In this manner, a total of 40 hours of stratospheric exposure was accumulated for each collector.

PROCESSING OF PARTICLES

Particle mounts designed for the JEOL 100CX scanning transmission electron microscope (STEM) are currently the standard receptacles for CD particles in the JSC laboratory. Each mount consists of a graphite frame (size ~3x6x2mm) onto which a Nucleopore filter (0.4 μm pore size) is attached. A conductive coat of carbon is vacuum evaporated onto the mount and then a microscopic reference pattern is "stenciled" onto the carbon-coated filter by vacuum evaporation of aluminum through an appropriately sized template. Particles are individually removed from collectors using glass-needle micromanipulators under a binocular stereo-microscope. Each particle is positioned on an aluminum-free area of a Freon-cleaned (Freon 113), carbon-coated filter and washed in place with hexane to remove silicone oil. Each mount is normally limited to 16 particles. All processing and storage of each particle is performed in a Class-100 clean room.

This catalog is the third to be produced from the new Large Area Cosmic Dust Collectors (LACS). These collectors have approximately one order of magnitude more collection surface area than the conventional collectors used for Cosmic Dust Catalogs 1-10.

PRELIMINARY EXAMINATION OF PARTICLES

Each rinsed particle is examined, before leaving the Class-100 clean room processing area, with a petrographic research microscope equipped with transmitted, reflected and oblique light illuminators. At a magnification of 500X, size, shape, transparency, color, and luster are determined and recorded for each particle.

After optical description, each mount (with uncoated particles) is examined by scanning electron microscopy (SEM) and X-ray energy-dispersive spectrometry (EDS). Secondary-electron imaging of each particle is performed with a JEOL-35CF SEM at an accelerating voltage of 20 kV. Images are therefore of relatively low contrast and resolution due to deliberate avoidance of conventionally applied conductive coats (carbon or gold-palladium) which might interfere with later elemental analyses of particles. EDS data are collected with the same JEOL-35CF SEM equipped with a Si(Li) detector and PGT 4000T analyzer. Using an accelerating voltage of 20 kV, each particle is raster scanned and its X-ray spectrum recorded over the 0-10 keV range by counting for 100 sec. No system (artifact) peaks of significance appear in the spectra.

It should be pointed out that the SEM/EDS procedure used in preparing this catalog is different than that used in preparing Cosmic Dust Catalogs, Volumes 1-3 and 8. In these catalogs, EDS analysis was performed using the JEOL 100CX STEM operated at 40 kV. Only the EDS spectra exhibit differences that are likely to be noticed. These differences are a slightly higher background and more efficient excitation of high atomic number elements for EDS spectra collected at 40kV relative to those collected at 20kV. However, each catalog includes spectra of the same selected comparison standards, which allows comparison of spectra from one catalog to the next to be made. Please refer to Section 5 for a more complete discussion.

Following SEM/EDS examination, each particle mount is stored in a dry nitrogen gas atmosphere in a sealed cabinet.

CATALOG FORMAT

Each page in the main body of the catalog is devoted to one particle and consists of an SEM image, an EDS spectrum, and a brief summary of preliminary examination data obtained by optical microscopy. The unique identification number assigned to the particle appears at the top of the page. Sources of the descriptive data are as follows:

SIZE (μm) is measured using the original SEM image and its known magnification factor. For an irregularly shaped particle, the minimum dimension in the plane of the field of view is located and determined; then a second (maximum) dimension is measured at a right angle to the first. For a spherical or equidimensional particle, only a single size is recorded.

SHAPE is generalized to be spherical (S), equidimensional (E), or irregular (I). Particles having shape intermediate between S and E, or E and I, are not uncommon and may be denoted as S/E or E/I, etc.

TRANSPARENCY (abbreviated TRANS) is determined by optical microscopy to be transparent (T), translucent (TL), or opaque (O). Significant variations in transparency within a particle are annotated on the SEM image.

COLOR is determined by optical microscopy using oblique (fiber optic, quartz halogen) illumination supplemented with normal reflected (tungsten-lamp) illumination. The distinction of dark (Dk.) from light (Lt.) particles is unambiguous, although the distinction of colorless (CL) from pale-colored conditions is sometimes problematical. Complex colorations of individual particles may be noted in the "COMMENTS" column and annotated on the SEM image.

LUSTER is determined by optical microscopy using reflected normal (tungsten-lamp) illumination and supplemented with oblique (fiber optic, quartz halogen) illumination. Commonly applied descriptions, adopted from mineralogical usage, include dull (D), metallic (M), submetallic (SM), subvitreous (SV), vitreous (V), and resinous (R). Lusters transitional between categories or difficult to identify are indicated accordingly (D/SM, SV/V, etc.)

TYPE indicates a **provisional first order identification** of each particle based on its morphology (from SEM image), elemental composition (from EDS spectrum), and optical properties. **We emphasize that, for catalog purposes, types are defined for their descriptive and curatorial utility, not as scientific classifications.** These tentative categorizations, which reflect judgements based on the collective experience of the CDPET, should not be construed to be firm identifications and should not dissuade any investigator from requesting any given particle for detailed study and more complete identification. The precise identification of each particle in our inventory is beyond the scope and intent of our collection and curation program. Indeed, the reliable identification and scientific classification of cosmic dust is one of many important research tasks that we hope this catalog will stimulate. We indicate particle "TYPE" only to aid the users of this catalog (especially those new to small particle analysis) in distinguishing possible cosmic dust particles from other particles which are invariably collected during stratospheric dust sampling. In this catalog, particles are organized according to their type. Categories used in this catalog are defined as follows:

C: Cosmic dust (variety unspecified) or other extraterrestrial material. In the strict sense, "cosmic dust" refers only to those particles which have not been modified during passage from interplanetary space to Earth's stratosphere. In this catalog, though, particle type "C" is used to conveniently group together all particles which are judged to be of extraterrestrial origin, including those that have apparently experienced strong ablational heating or melting. Type "C" particles are provisionally identified as those having one of the three following sets of attributes:

(a) irregular to spherical, opaque, dark-colored particles composed mostly of Fe with minor S and Ni.

(b) irregular to spherical, translucent to opaque, dark-colored particles containing various

proportions of Mg, Si, and Fe with traces of S and/or Ni.

(c) irregular to faceted or blocky, transparent to translucent particles containing mostly Mg, Si, and Fe but with traces S and/or Ni.

Category (a) and (b) particles commonly display either complex, porous aggregate type morphologies or distinctively spherical shapes and dull to metallic lusters which distinguish them from terrestrial minerals. Their EDS spectra are reminiscent of those exhibited by meteoritic Fe-NiS minerals, or combinations of Fe-Ni-S phases with olivine and/or pyroxene. Category (c) particles display morphologies and EDS spectra which suggest that they are fragments of olivine or pyroxene crystals, neither of which are significant components of stratospheric volcanic ash. Particles which do not fall easily into categories (a), (b), or (c) but which possess some of the same attributes may be classified here as "C?".

TCA: Terrestrial contamination (artificial or man-made). Particles included in the "TCA" category are commonly irregular in shape (though a few may be spherical) and may be transparent, translucent, or opaque. Their EDS spectra commonly show Al, Fe, or Si as the principal peaks but with a variety of minor peaks including those of Cd, Ti, V, Cr, Mn, Ni, Cu, or Zn and at abundances which are frequently much greater than those expected in common minerals. However, such compositions are similar to those expected for certain metal alloys. In some cases, a high intensity (relative to intensities of characteristic X-ray peaks) of continuum radiation occurs in the EDS spectrum, suggesting that low atomic number elements not detectable by the EDS (e.g., H, C, N, O) are abundant in the particle. Such "TCA" particles are tacitly inferred to by synthetic carbon based materials. (This category probably includes particles produced by or derived from aircraft operation or collector hardware, or possibly spacecraft debris. However, some of these particles are worthy of additional research and may represent true extraterrestrial "low Z" material).

TCN: Terrestrial contamination (natural). "TCN" particles may be transparent to opaque and may exhibit a variety of colors. However, they are commonly irregular in shape and distinctively rich in Si and Al with minor abundances of Na, K, Ca, or Fe. Some Fe-S particles are classified as TCN despite the fact that they may well be extra-terrestrial. This action is due to the lack of conclusive investigations regarding these particular particles. Many particles containing only low-Z elements are also classified TCN for the same reason. Morphologies and EDS spectra of most "TCN" particles compare favorably with respective properties of silica polymorphs, feldspar, or silicic volcanic glass, three materials which are principal components of stratospheric volcanic ash. In addition, platy or porous aggregate-type particles of light color and Si, Al rich composition may be silicic clay minerals, common phases in Earth's surface soils. Irregular, reddish Fe rich particles may also be products of terrestrial rock weathering. Recognition of these and other phases as "TCN" particles is based mostly on CDPET's collective mineralogical experience and comparison with reference samples. Less commonly, the "TCN" category may include

distinctive particles with apparently non-random shapes which are rich in low atomic number elements (as inferred from their EDS spectra having high levels of continuum x radiation and relatively small peaks for characteristic Xrays). Those rare particles are distinguished from "TCA" particles by their unusual, organized morphologies and probably represent biological contaminants.

AOS: Aluminum oxide sphere. An AOS is transparent, subvitreous to vitreous in luster, colorless to pale yellow and at least approximately spherical. However, shape may range from nearly perfect sphericity to pronounced ellipticity and surface texture may range from very smooth to rough. Other spheres or irregularly shaped material may be attached to its surface. Al is the distinctively dominant (or only) peak in its EDS spectrum. A sphere displaying the attributes of an AOS except with major elements in addition to Al may be listed as "AOS?" or "?". Transparent Al rich particles of irregular shape would probably be listed as "TCA?". (AOS particles are products of solid fuel rocket exhausts.)

Again, this system for provisional classification of particles is presented only as a first order attempt to distinguish particles which are probably extraterrestrial in origin from those which are probably contaminants. All particles will require careful research examination before they can be satisfactorily identified.

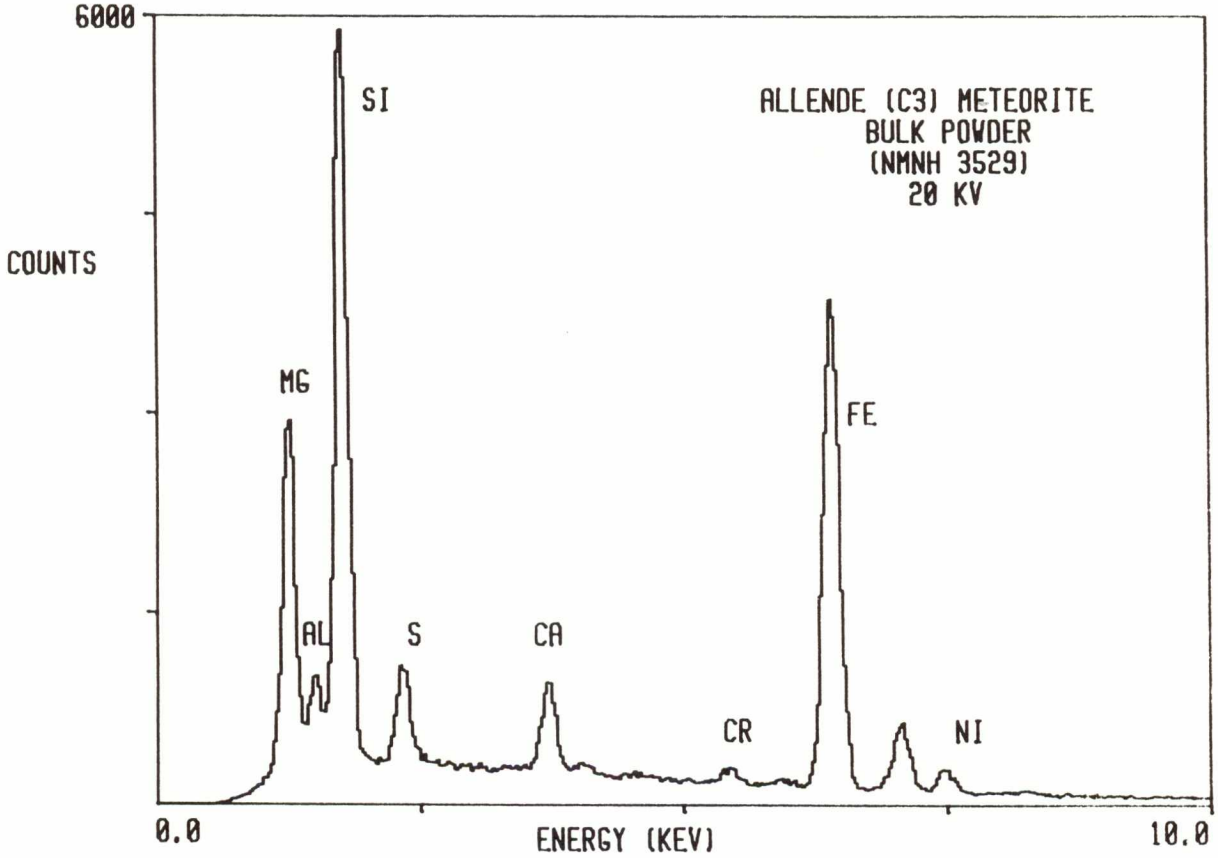
COMMENTS are included for particles with special features or histories. All of the larger, cluster particles have broken apart and are present in the catalog as different grains, and the comments reflect these relationships.

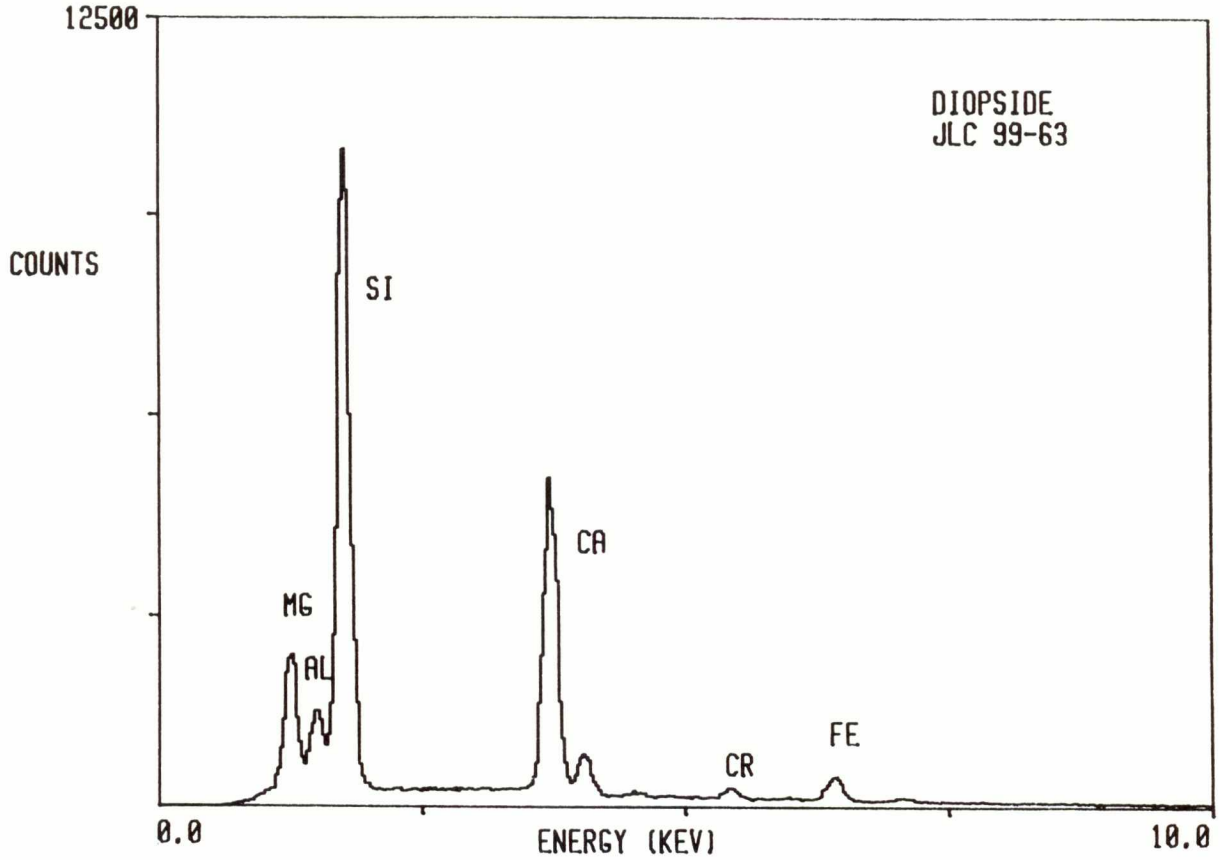
ANALYSES OF REFERENCE MATERIALS

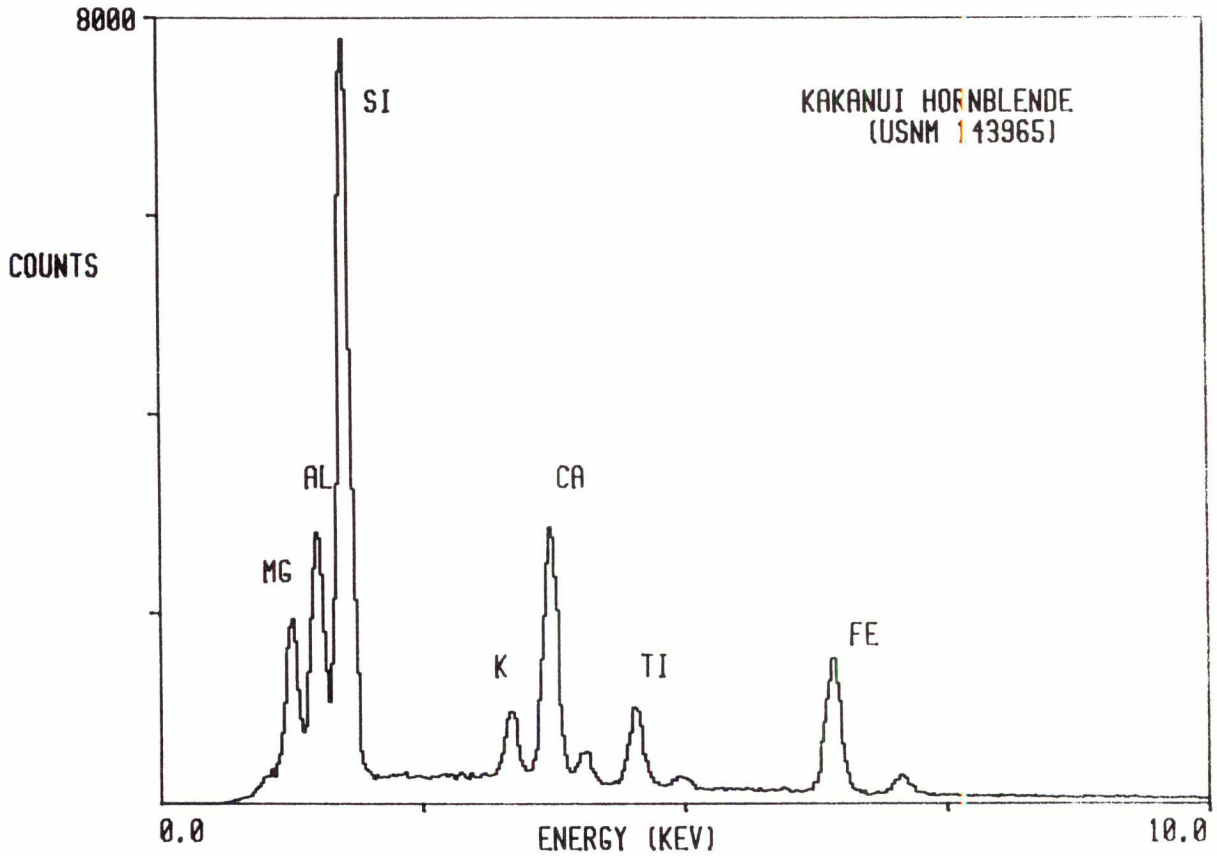
The usefulness of the SEM images and EDS spectra provided for particles in this catalog is enhanced by comparison with similar data products obtained for mineral standards of known composition. Accordingly, a typical EDS spectrum is presented for each of three standard minerals prepared as polished grain mounts (San Carlos olivine, USNM 111312/444; diopside JLC 99 63; Kakanui hornblende, USNM 143965; Allende Meteorite Bulk Powder, NMNH 3529). Analyses of these optically flat surfaces eliminate inter-sample geometrical variations so that effects of detection limits and compositional variations, in general, on relative peak heights in the raw spectra can be more readily assessed. Even so, the polished grain spectra should not be over interpreted because no corrections have been attempted for atomic number, absorption, or fluorescence effects. The spectra are presented simply as additional aids to the meaningful use of the sample particle EDS spectra. Investigators who might wish to compare performance characteristics of their EDS analytical systems with those of the system used by CDPET in preparing these catalog data should contact Curator/Cosmic Dust at the address given in Section 6. A short-term loan of a polished grain mineral standard can then be arranged.

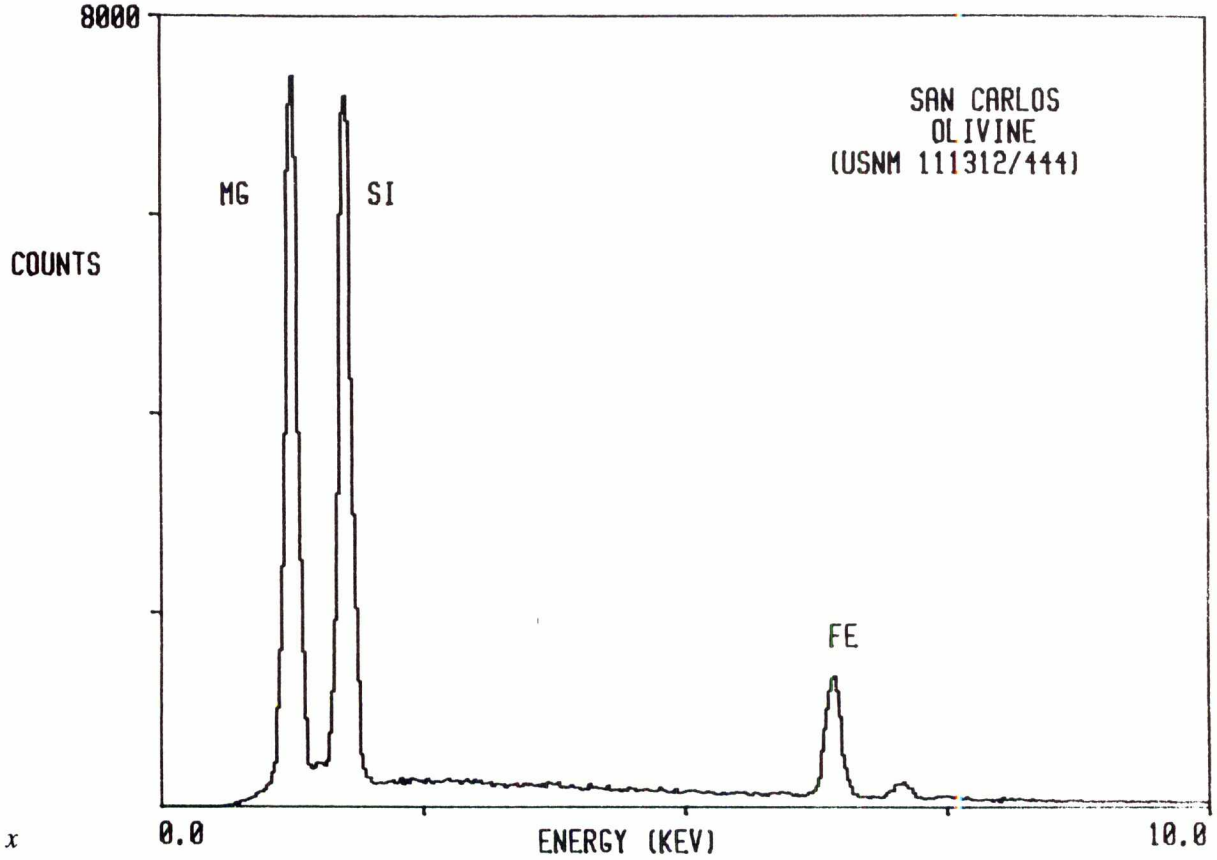
As pointed out in Section 3, the EDS spectra included in this catalog were obtained using a primary electron energy of 20 kv whereas spectra in Catalogs 1-3 and 8 were obtained with a different instrument operated at 40 kV. Although the

effects on EDS spectra to be expected from such a change are well known from X-ray spectrometric analysis, they are worth pointing out to avoid confusion among the readers of this catalog. The major effects of concern to Cosmic Dust Catalog users can be seen by comparing the two "Allende (C3) Meteorite Bulk Powder" spectra, one of which was obtained at 20 kV and the other at 40 kV, as presented in Cosmic Dust Catalogs 1-3 and 8 (only spectra collected at 20kV are presented in this catalog). In the 20 kV spectrum, the Si peak is more intense than the principal peak of Fe whereas the opposite is true for the 40 kV spectrum. In general, the 20 kV spectra in this catalog will show peaks of light elements enhanced relative to peaks of heavy elements when compared with 40 kV spectra published in Catalogs 1-3 and 8. The explanation is based both on geometrical differences between X-ray paths in the two EDS systems (the JEOL-35CF system is actually more favorable for light element analysis) and on electron and X-ray physics (X-ray emission by heavy elements is more intense at 40 kV than at 20 kV). Thus, readers are cautioned against attempting to quantitatively intercompare 40 kV spectra with 20 kV spectra. Still, the spectra in each catalog should continue to serve as originally intended. Namely, the sample and standard spectra in any given catalog will represent a self consistent data set.


6000
COUNTS
SI
ALLENDE (C3) METEORITE
BULK POWDER
(NMNH 3529)
20 KV
MG
FE
AL
S
CA
CR
NI
0.0
ENERGY (KEV)
10.0


12500
COUNTS
DIOPSIDE
JLC 99-63
SI
CA
MG
AL
FE
CR
0.0
ENERGY (KEV)
10.0


8000
COUNTS
SI
KAKANUI HORNBLENDE
(USNM 143965)
AL
CA
MG
K
TI
FE
0.0
ENERGY (KEV)
10.0


8000
COUNTS
MG
SI
SAN CARLOS
OLIVINE
(USNM 111312/444)
FE
0.0
ENERGY (KEV)
10.0

SAMPLE REQUESTS

Scientists desiring to perform detailed research on particles described in this catalog should apply in writing to:

Curator/Cosmic Dust
Code SN2
NASA/Johnson Space Center
Houston, Texas 77058
U.S.A.

Telephone: (713) 483-5128
FTS: 525-5128

Sample requests should refer to specific particle identification numbers and should describe the research being proposed as well as the qualifications and facilities of the investigator making the request. Publication reprints are frequently useful in sample allocation considerations. Additionally, requests for particles not yet passed through preliminary examination will be considered if the requester can demonstrate a strong need for them. NASA will arrange for a review of the scientific merits of each request and will inform the requester of the results.

Approval of a sample request does not imply or include funding for the proposed research. Questions about NASA funding should be directed to:

Dr. Donald D. Bogard
Discipline Scientist
Planetary Materials and
Geochemistry Program
Code SN-4
NASA/Johnson Space Center
Houston, TX 77058

Although foreign scientists are welcome to request samples, NASA cannot provide funds to be spent outside the U.S.A. by citizens of other countries.

ACKNOWLEDGEMENTS

Norm La Fleur and coworkers (NASA/Ames Research Center, Moffett Field, California) performed the loading and unloading of the cosmic dust collectors on the ER-2 aircraft and provided flight log data.

Eugene Jarosewich (Smithsonian Institution, Washington, D.C.) kindly provided mineral standards and the Allende chondrite powder.

PARTICLE TABLE OF CONTENTS

Since particles are arranged in this catalog by type, rather than sequentially by mount and number as in previous catalogs, we include a sequential listing of particles and the page on which they may be found, for the user's reading pleasure.

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K3	289
K4	225
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K6	290
K7	81
K8	291
K9	292
K10	293
K11	226
K12	227
K13	294
K14	228
K15	295
K16	229
K17	82
L1	230
L2	83
L3	231
L4	84
L5	232
L6	296
L7	233
L8	297
L9	234
L10	235
L11	298
M1	236
M2	237
M3	238
M4	299
M5	85
M6	239
M7	240
M8	86
M9	300
M10	301
M11	241
M12	242
M13	243
M14	302
M15	303
N1	87
N2	88
N3	89
N4	90
N5	244
N6	91
N7	92
N8	93
N9	304
N10	94
N11	95
N12	96
N13	97
N14	305
N15	245
O1	98
O2	99
O3	100
O4	101
O5	102
O6	103
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P14	113
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Q8	121
Q9	122
Q10	123
Q11	124
Q12	125
Q13	126
Q14	210
R1	127
R2	311
R3	128
R4	312
R5	248
R6	313
R7	129
R8	249
R9	314
R10	250
R11	130
R12	131
R13	132
R14	133
S1	315
S2	134
S3	316
S4	135
S5	136
S6	317
S7	318
S8	137
S9	251
S10	252
S11	253
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T5	256
T6	143
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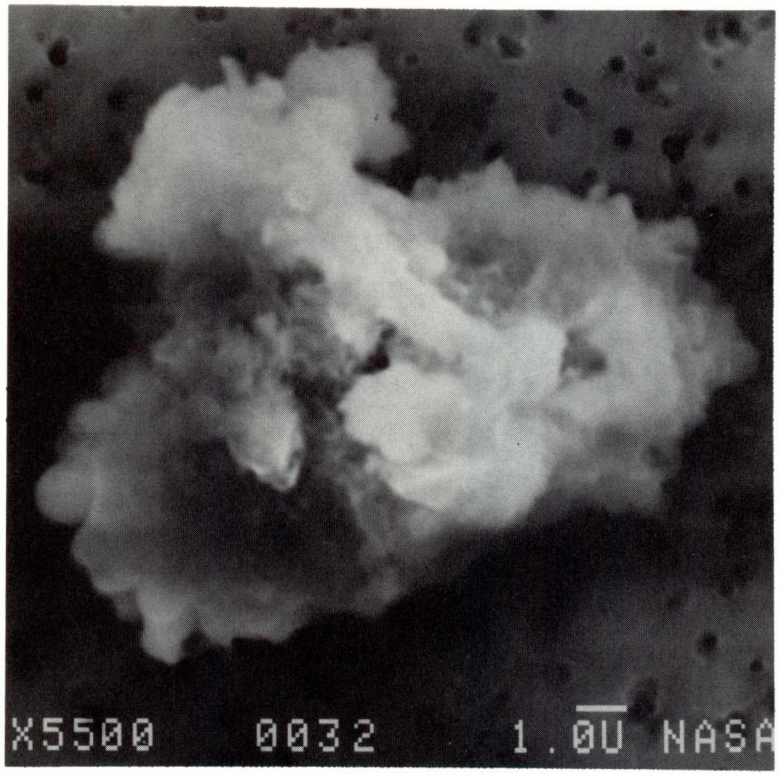
Particle Descriptions

C and C? Type

L2005 AB 1



S-92-35941

SIZE: 14x12

SHAPE: I

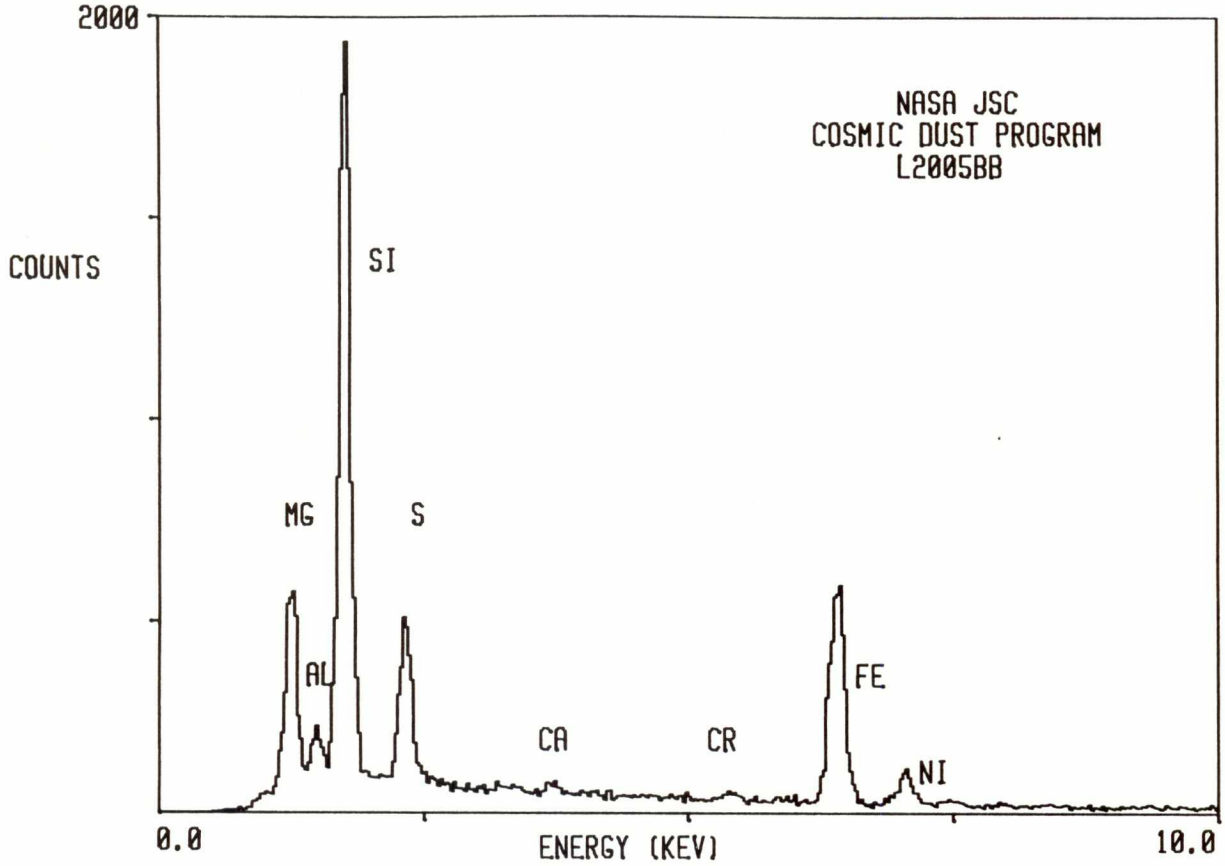
TRANS.: O

COLOR: Black

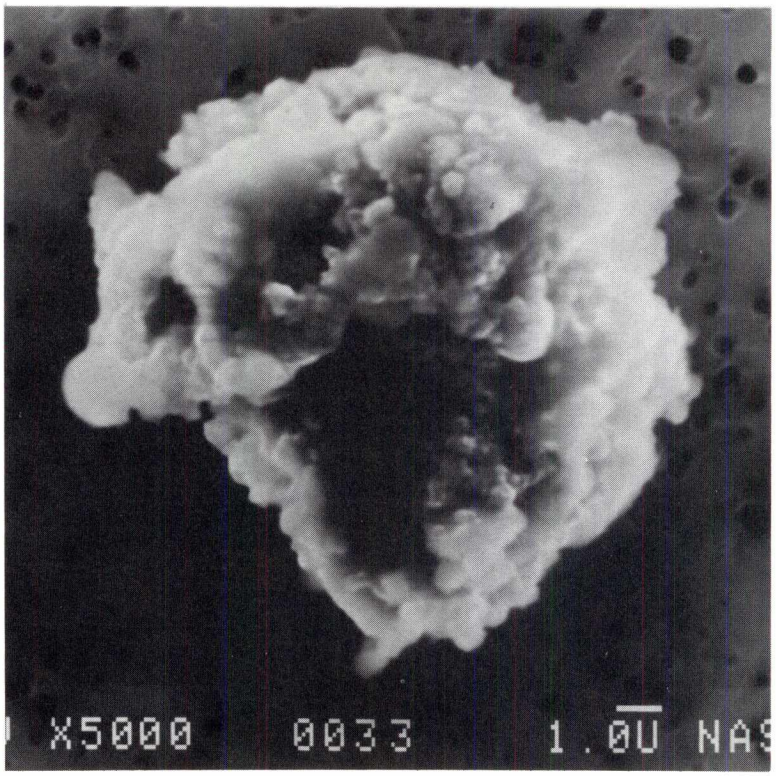
LUSTER: D

TYPE: C

COMMENTS:



L2005 AB 2



S-92-35942

SIZE: 15x13

SHAPE: I

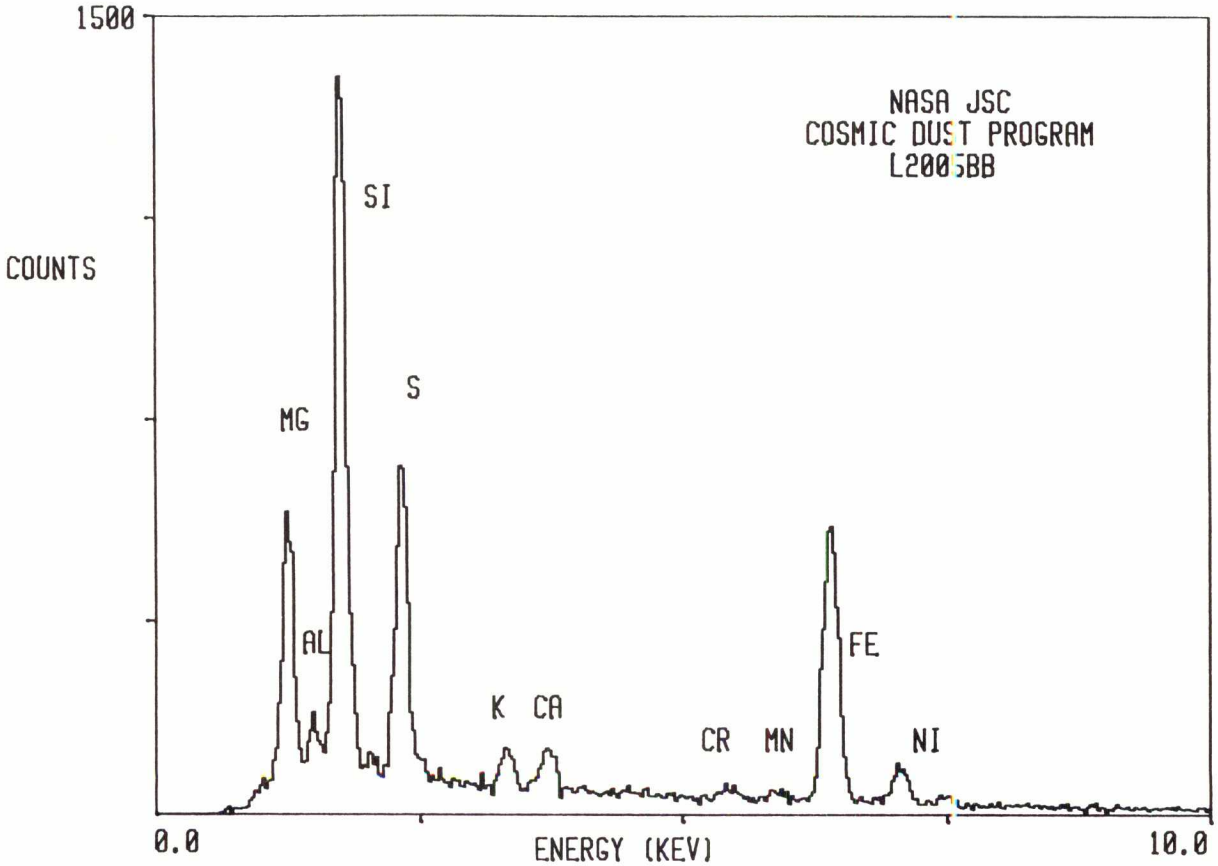
TRANS.: O

COLOR: Black

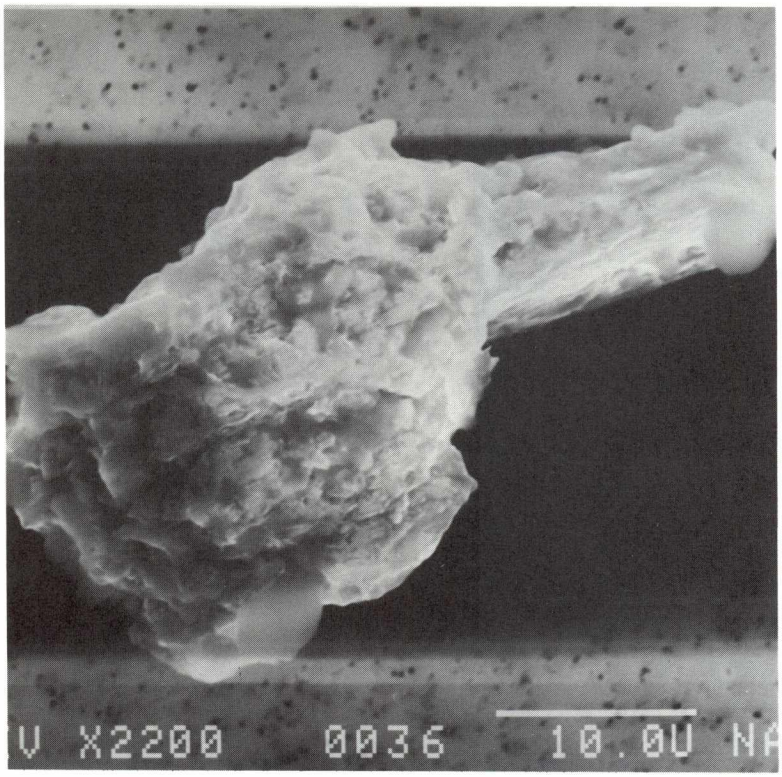
LUSTER: D

TYPE: C?

COMMENTS:
K is high



L2005 AB 3



S-92-35943

SIZE: 44x22

SHAPE: I

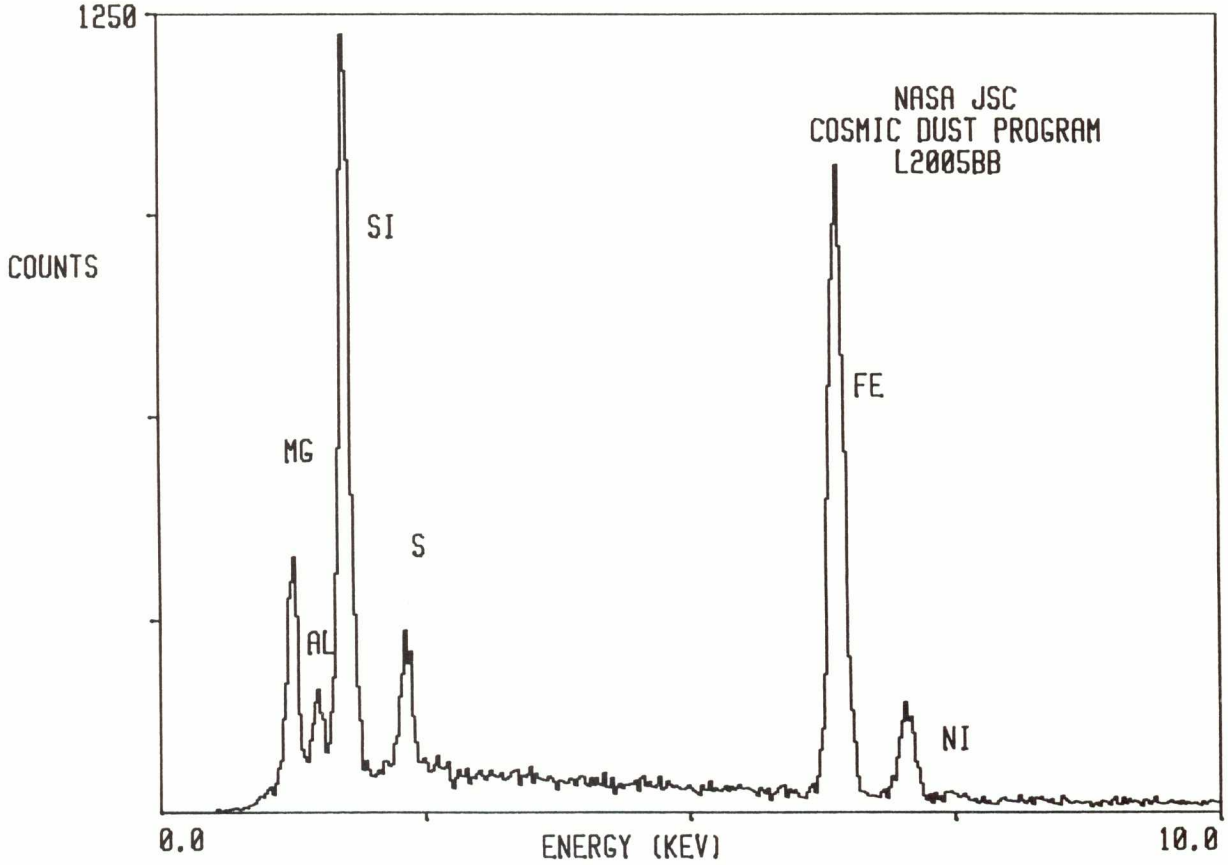
TRANS.: O

COLOR: Brown to Black

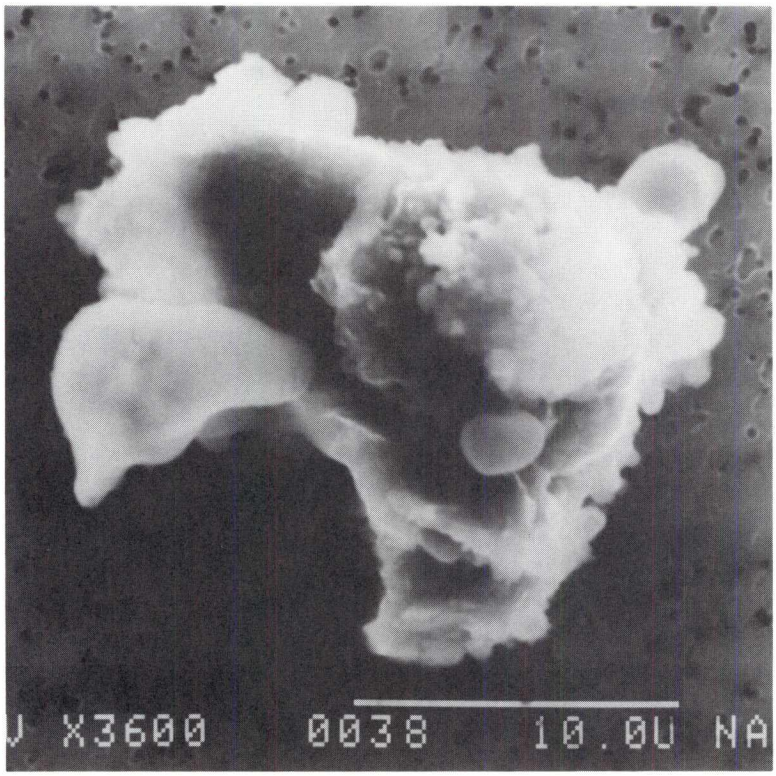
LUSTER: R

TYPE: C

COMMENTS:



L2005 AB 4



S-92-35944

SIZE: 22x19

SHAPE: I

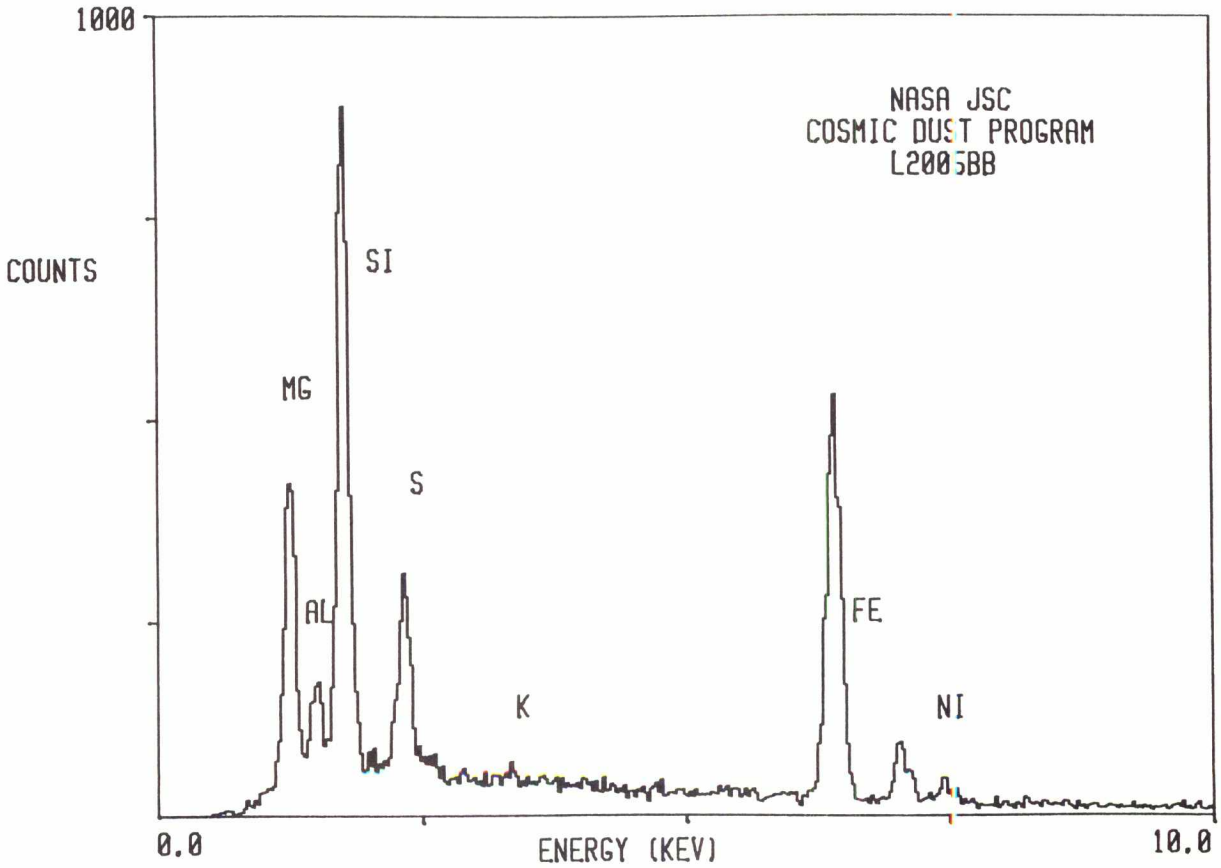
TRANS.: O

COLOR: Brown to Black

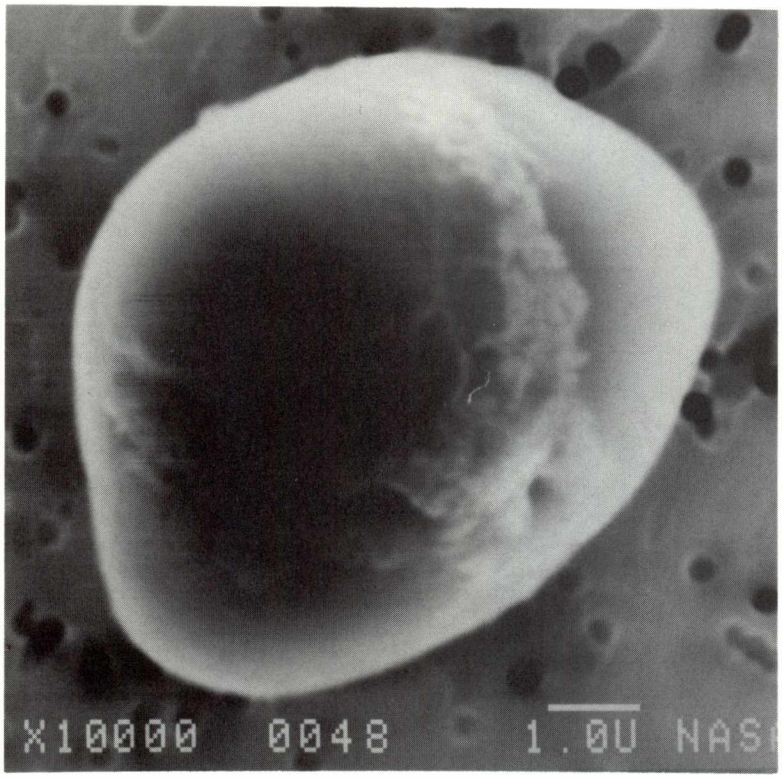
LUSTER: D

TYPE: C

COMMENTS:



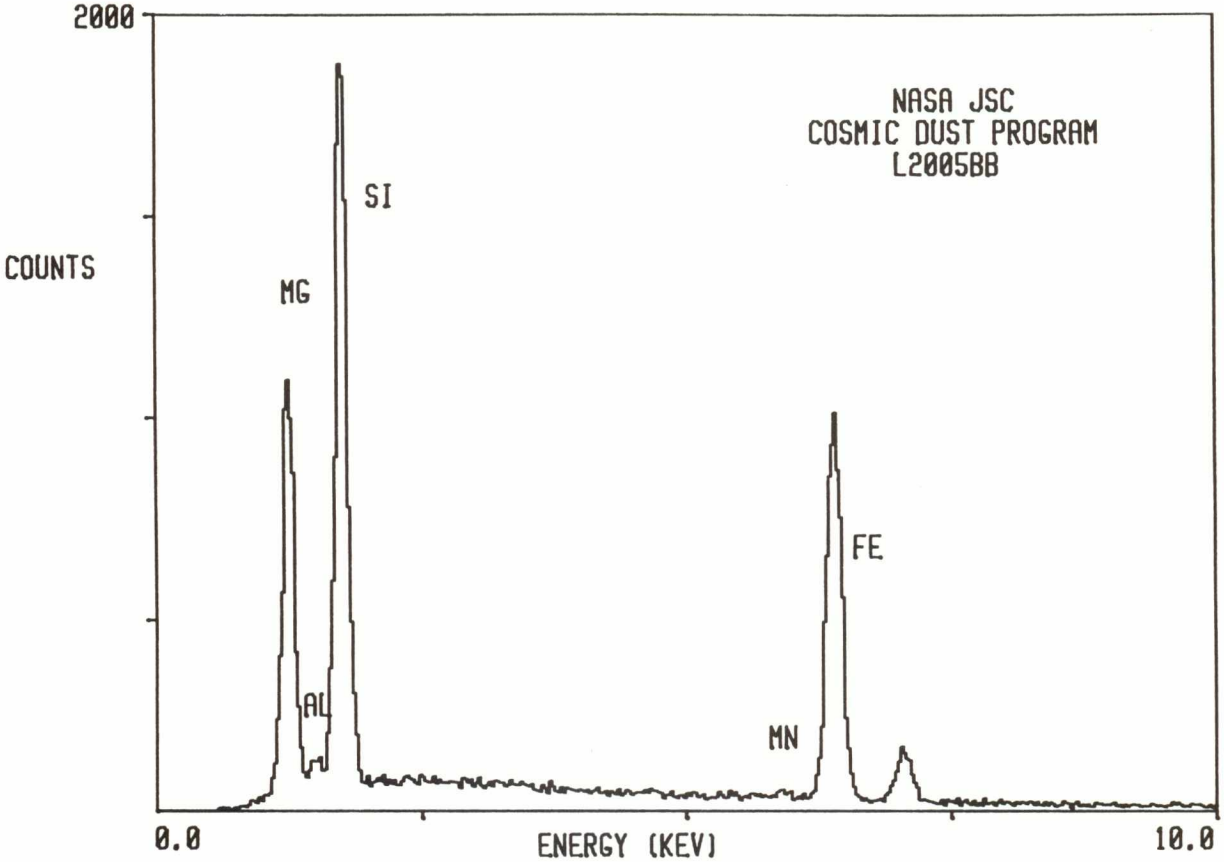
L2005 AB 12



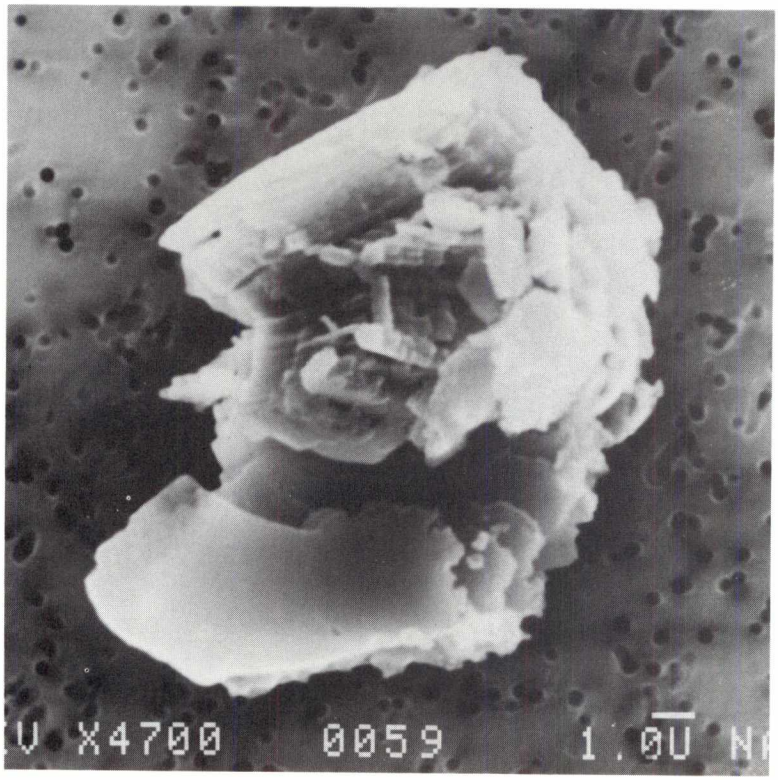
S-92-35952

SIZE: 7
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



L2005 AB 15



S-92-35955

SIZE: 14x12

SHAPE: E

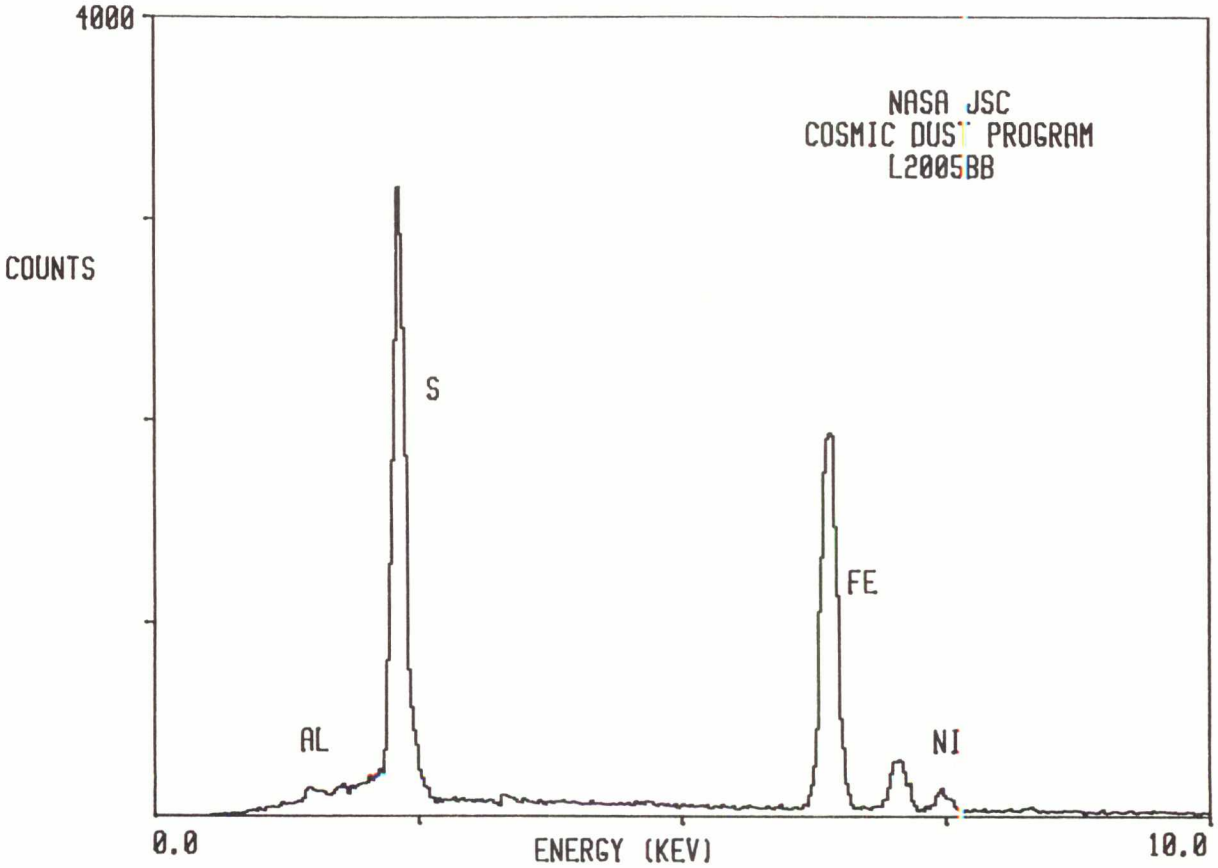
TRANS.: O

COLOR: Black to White

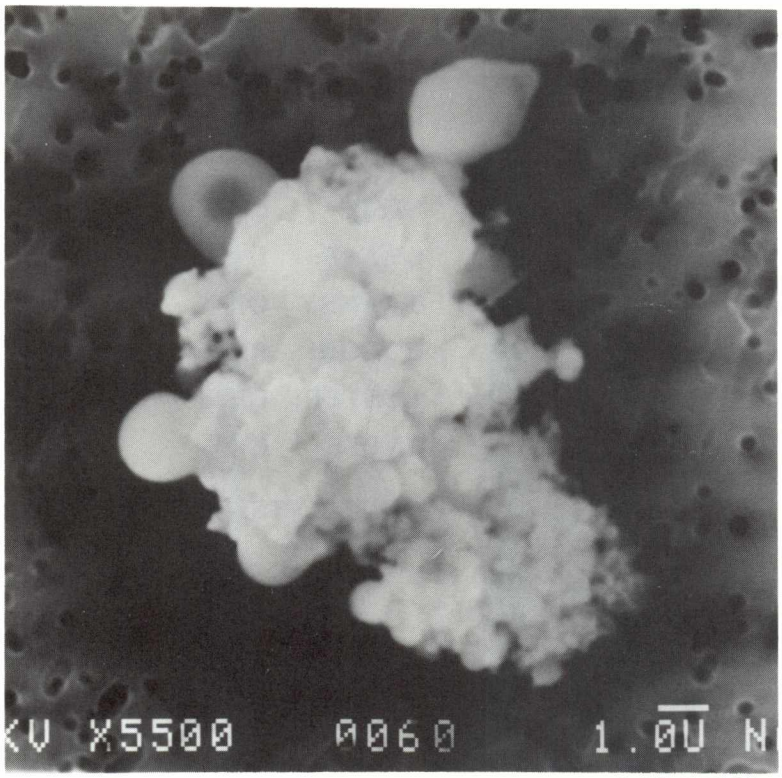
LUSTER: R

TYPE: C

COMMENTS:



L2005 AB 16



S-92-35956

SIZE: 12x8

SHAPE: I

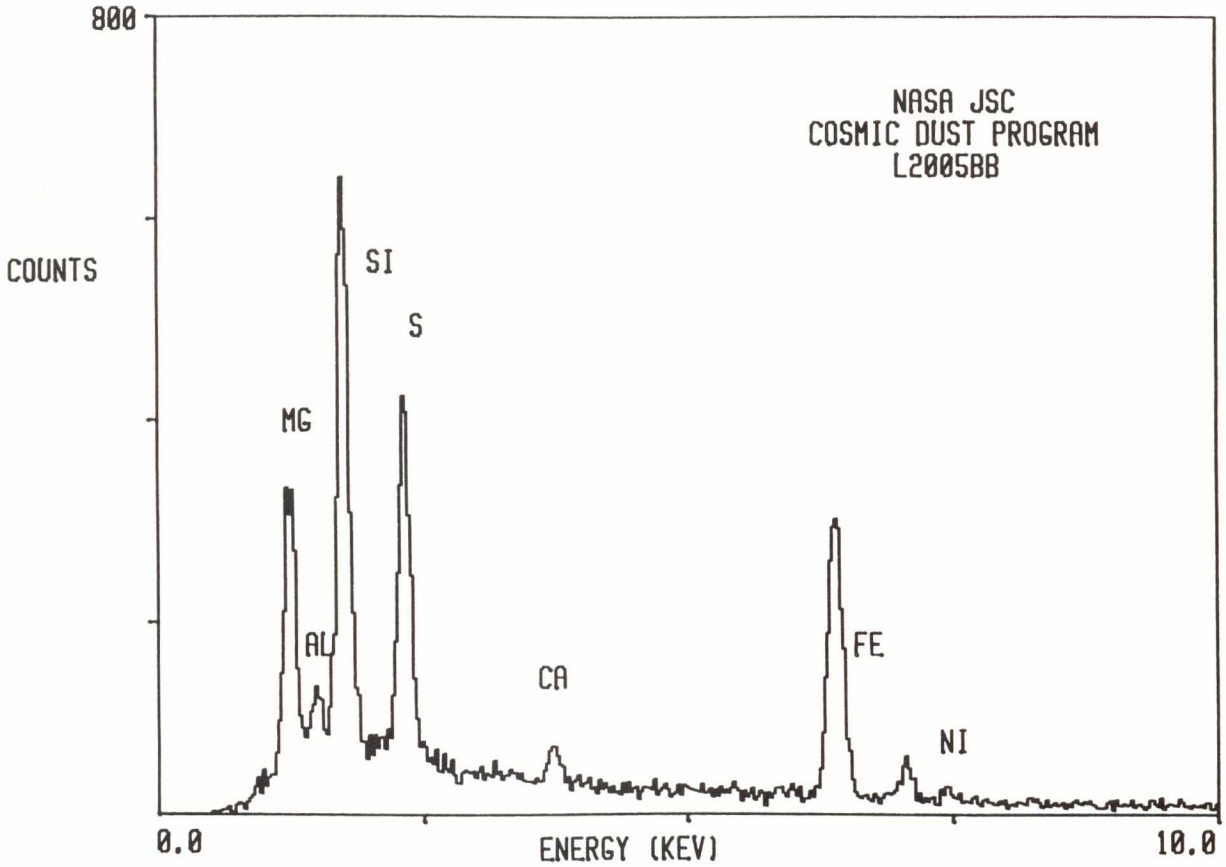
TRANS.: O

COLOR: Black

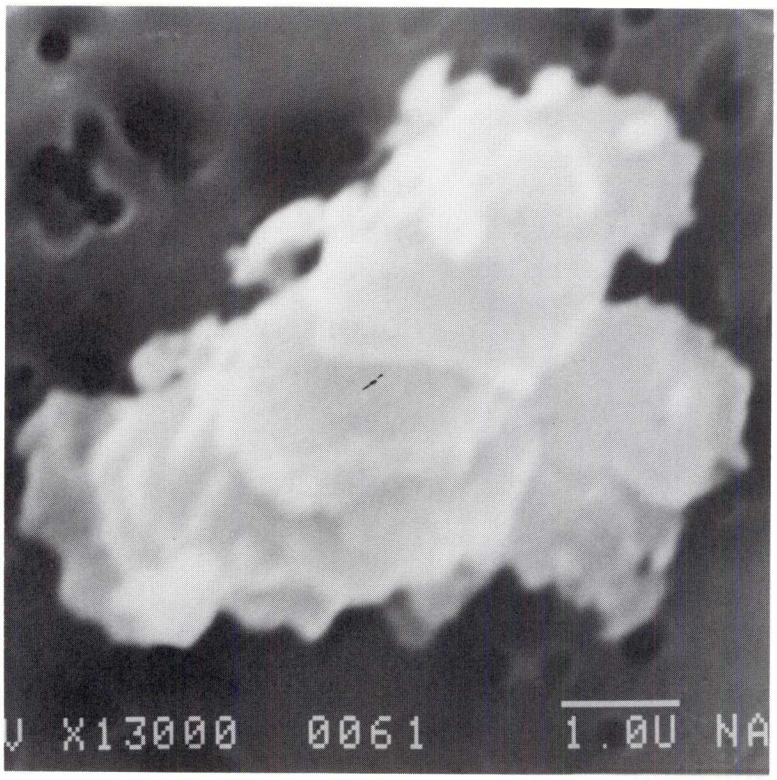
LUSTER: D

TYPE: C

COMMENTS:



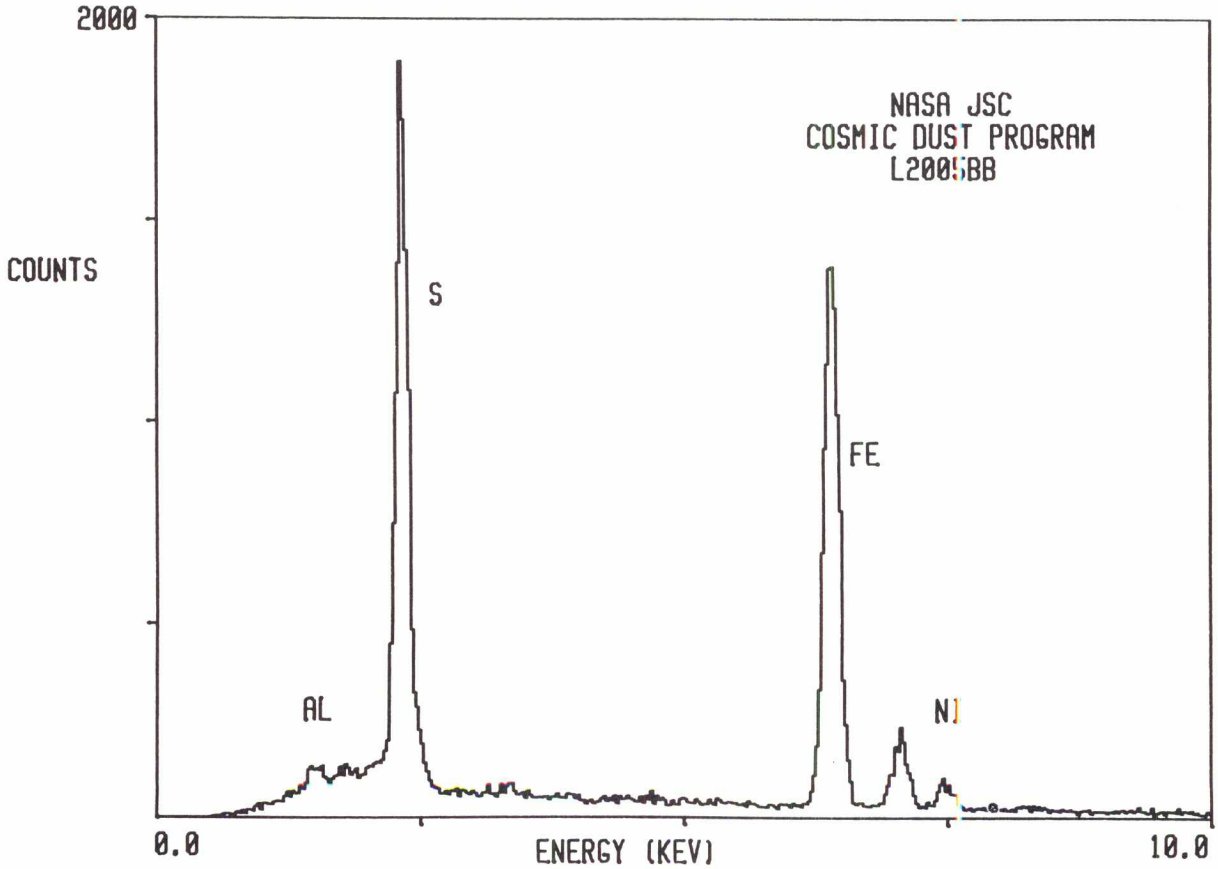
L2005 AB 17



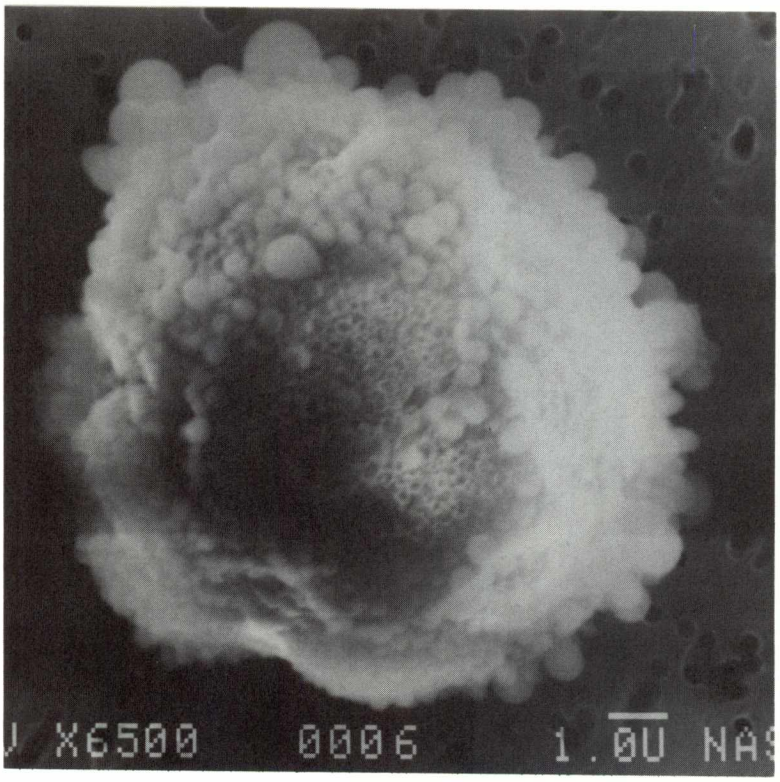
S-92-35957

SIZE: 6
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



L2005 AC 3



S-92-35928

SIZE: 11

SHAPE: S

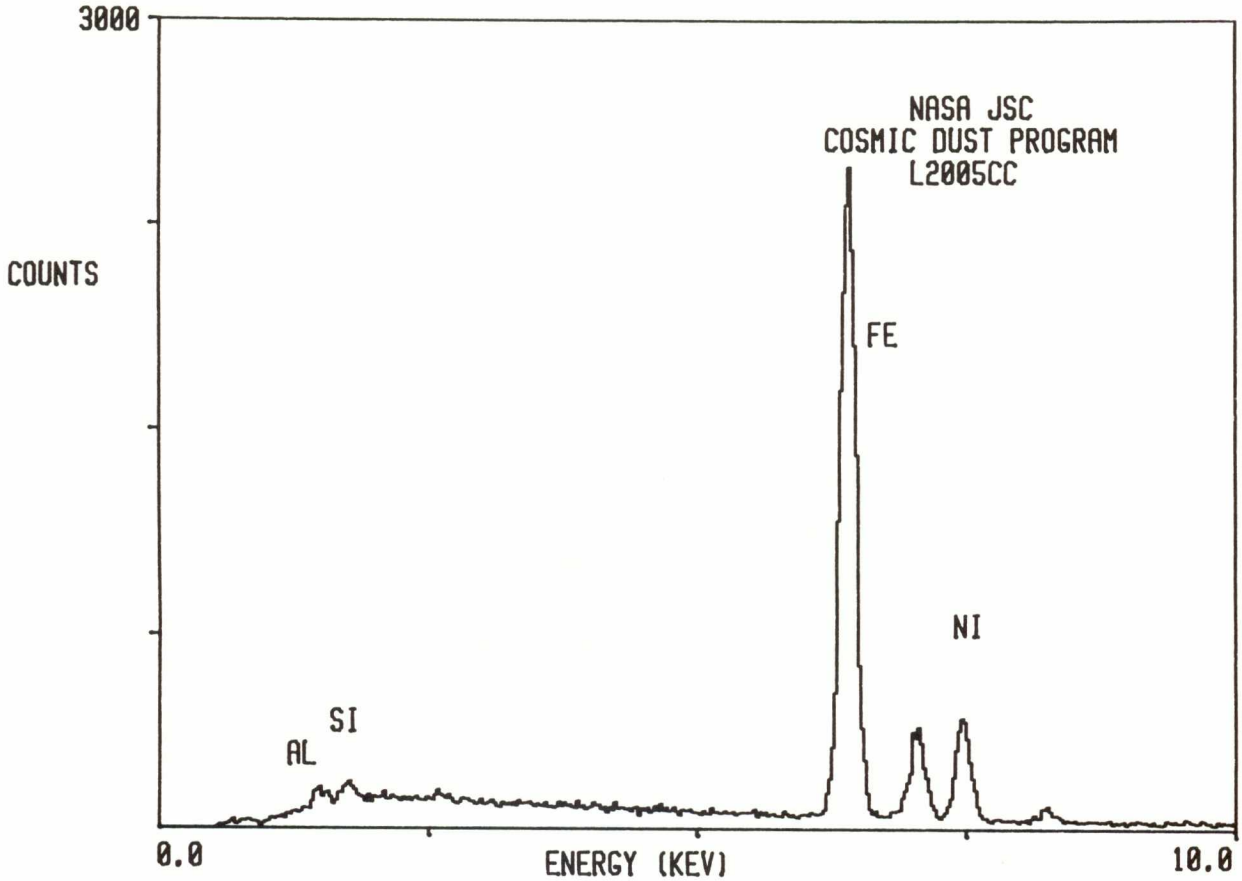
TRANS.: O

COLOR: Black

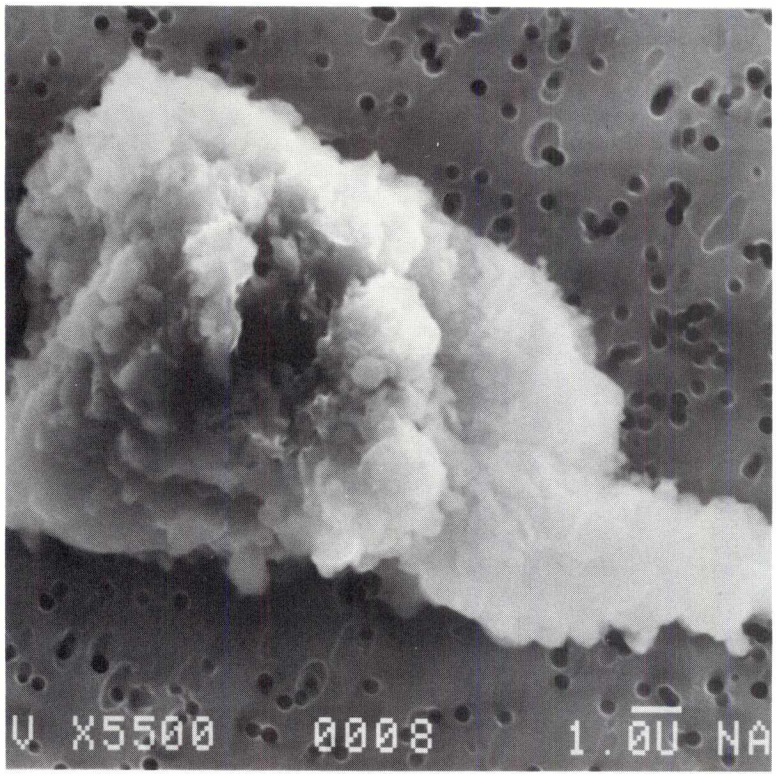
LUSTER: R

TYPE: C?

COMMENTS:



L2005 AC 4



S-92-35929

SIZE: 19x11

SHAPE: I

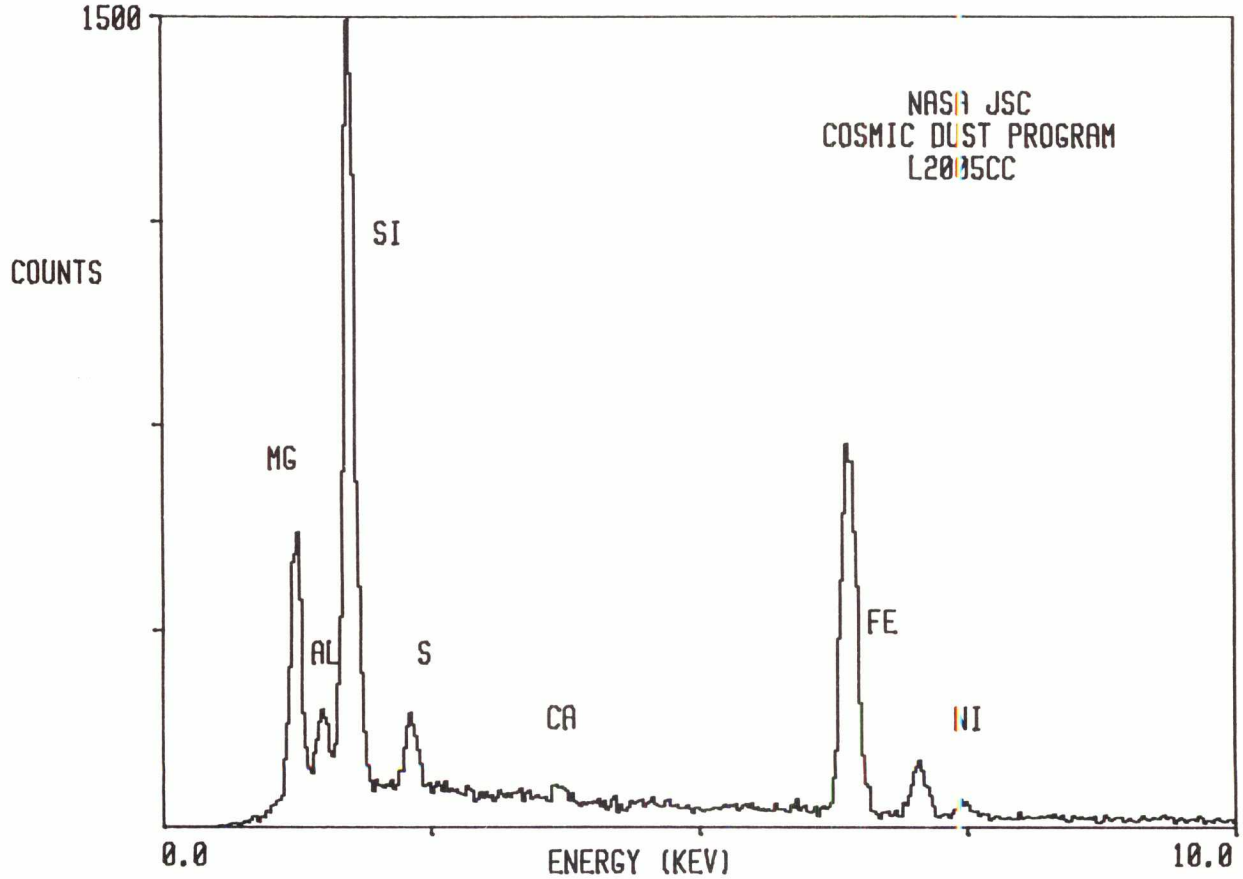
TRANS.: O

COLOR: Black

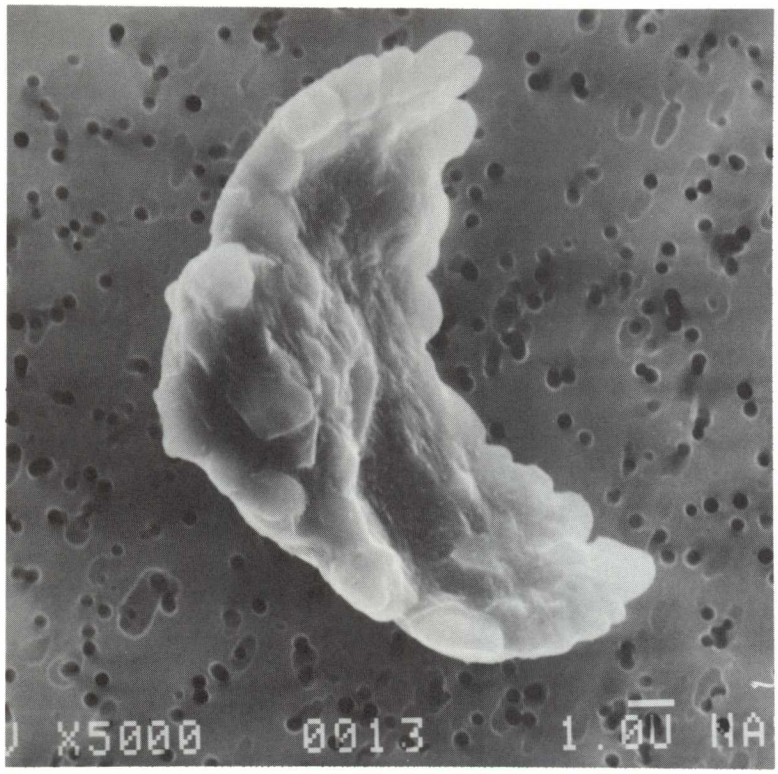
LUSTER: D

TYPE: C

COMMENTS:



L2005 AC 6



S-92-35931

SIZE: 13x5

SHAPE: I

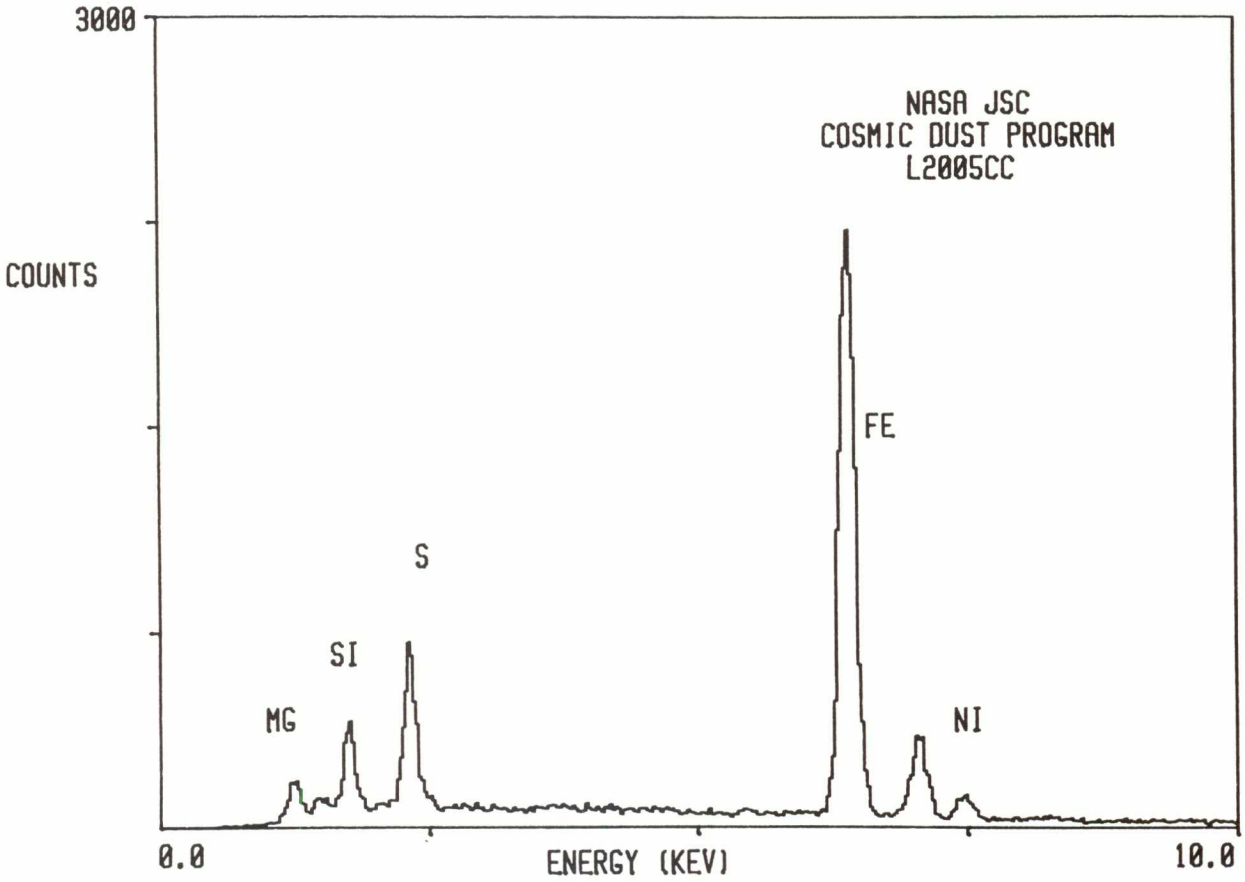
TRANS.: O

COLOR: Black

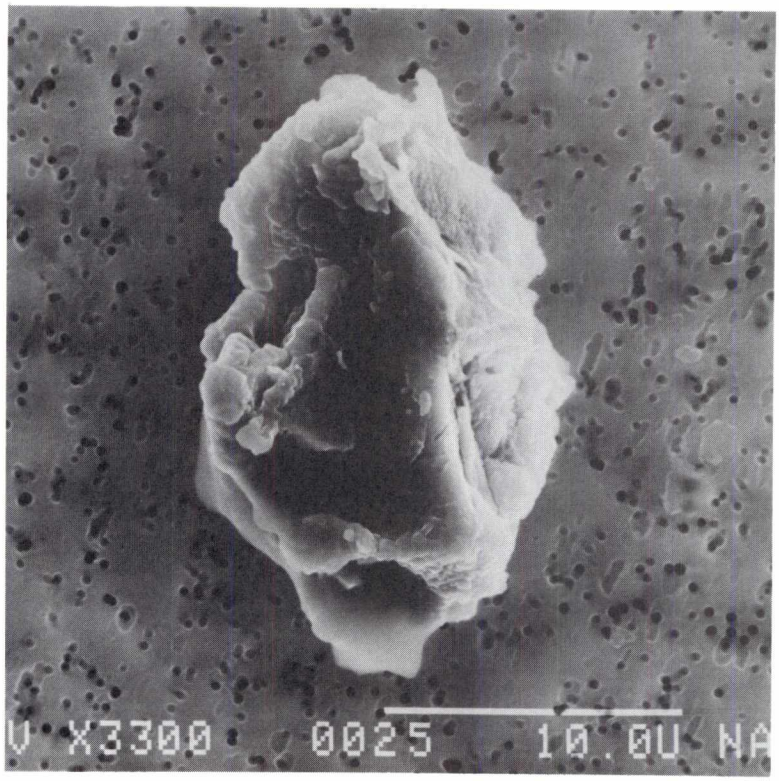
LUSTER: R

TYPE: C

COMMENTS:



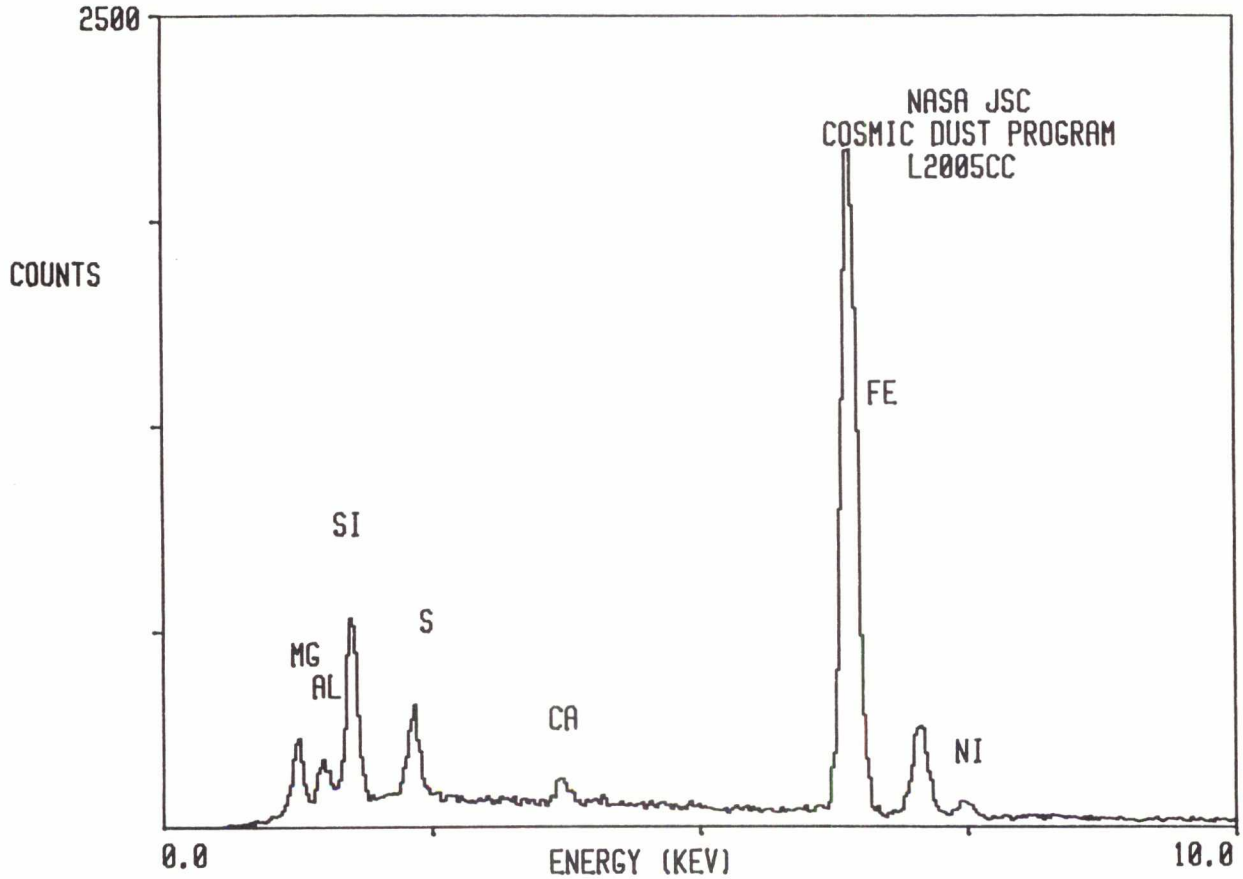
L2005 AC 11



S-92-35936

SIZE: 27x13
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:

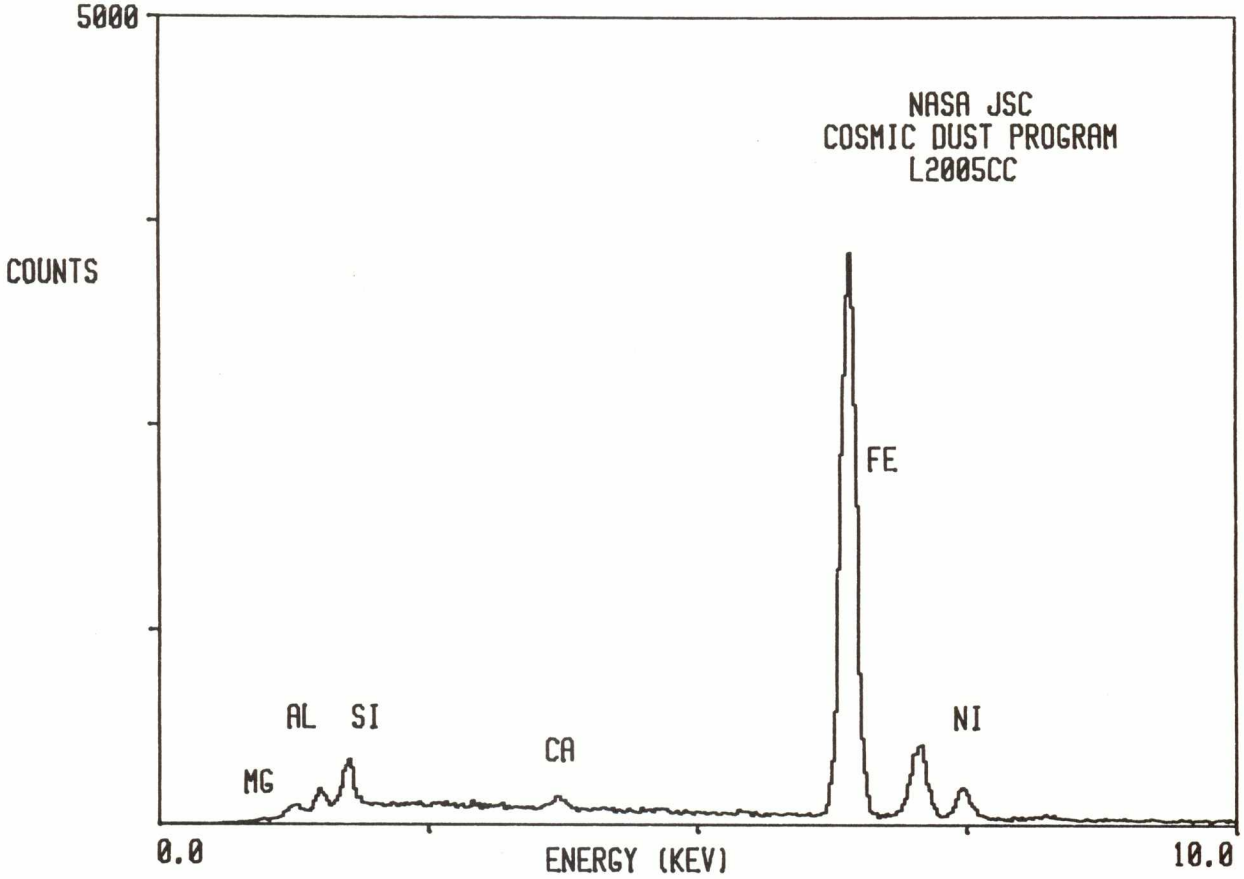


L2005 AC 12

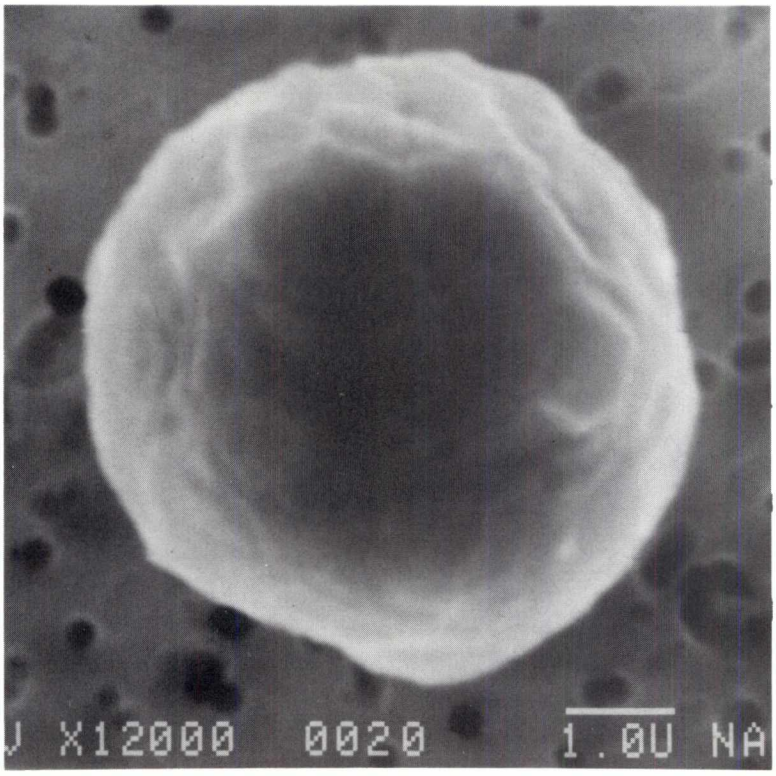
S-92-35937

SIZE: 9
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



L2005 AD 2



S-92-35903

SIZE: 6

SHAPE: S

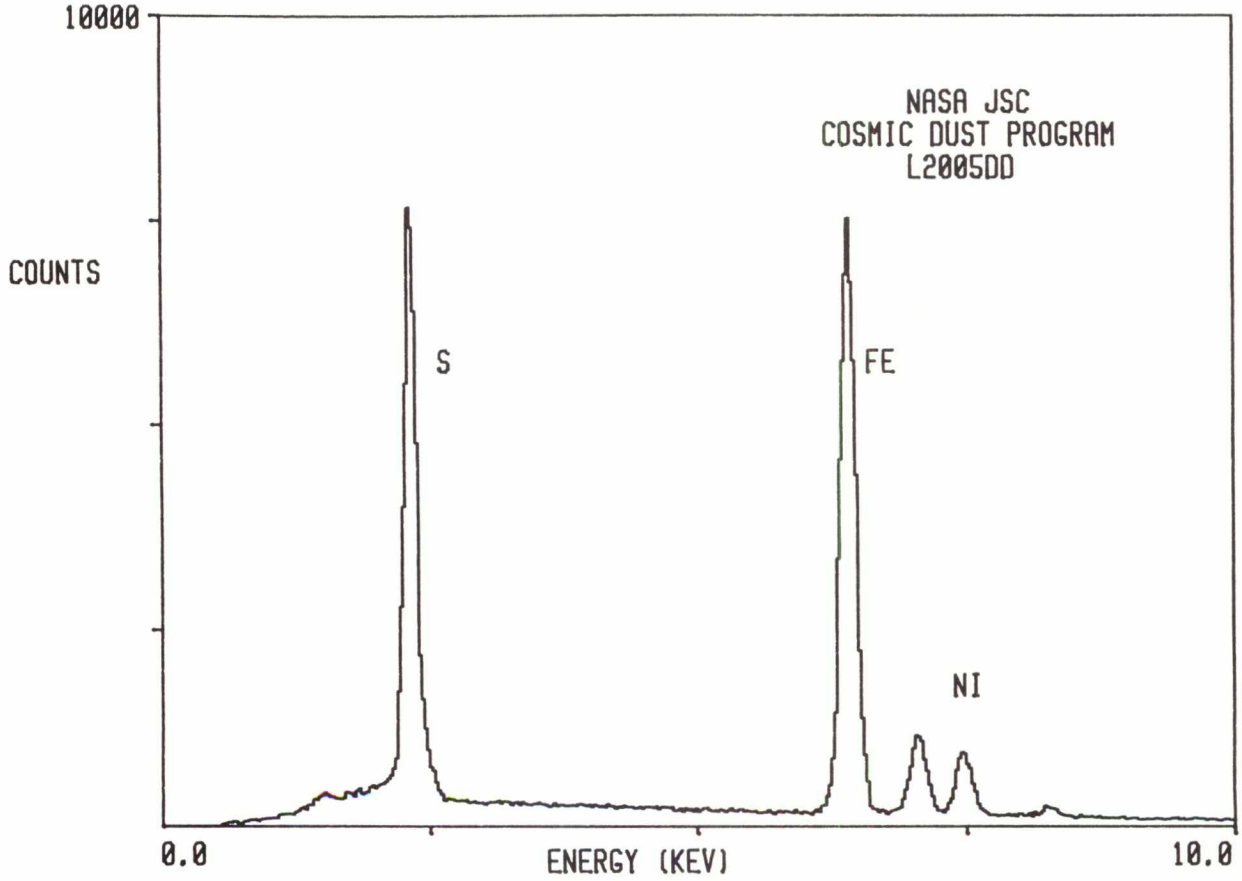
TRANS.: O

COLOR: Black

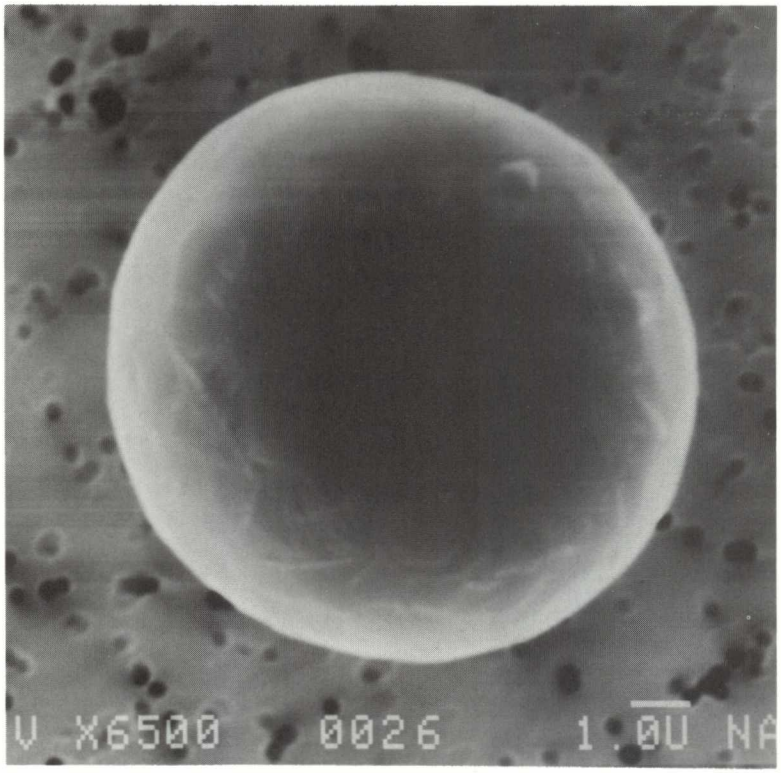
LUSTER: M

TYPE: C

COMMENTS:



L2005 AD 6



S-92-35907

SIZE: 11

SHAPE: S

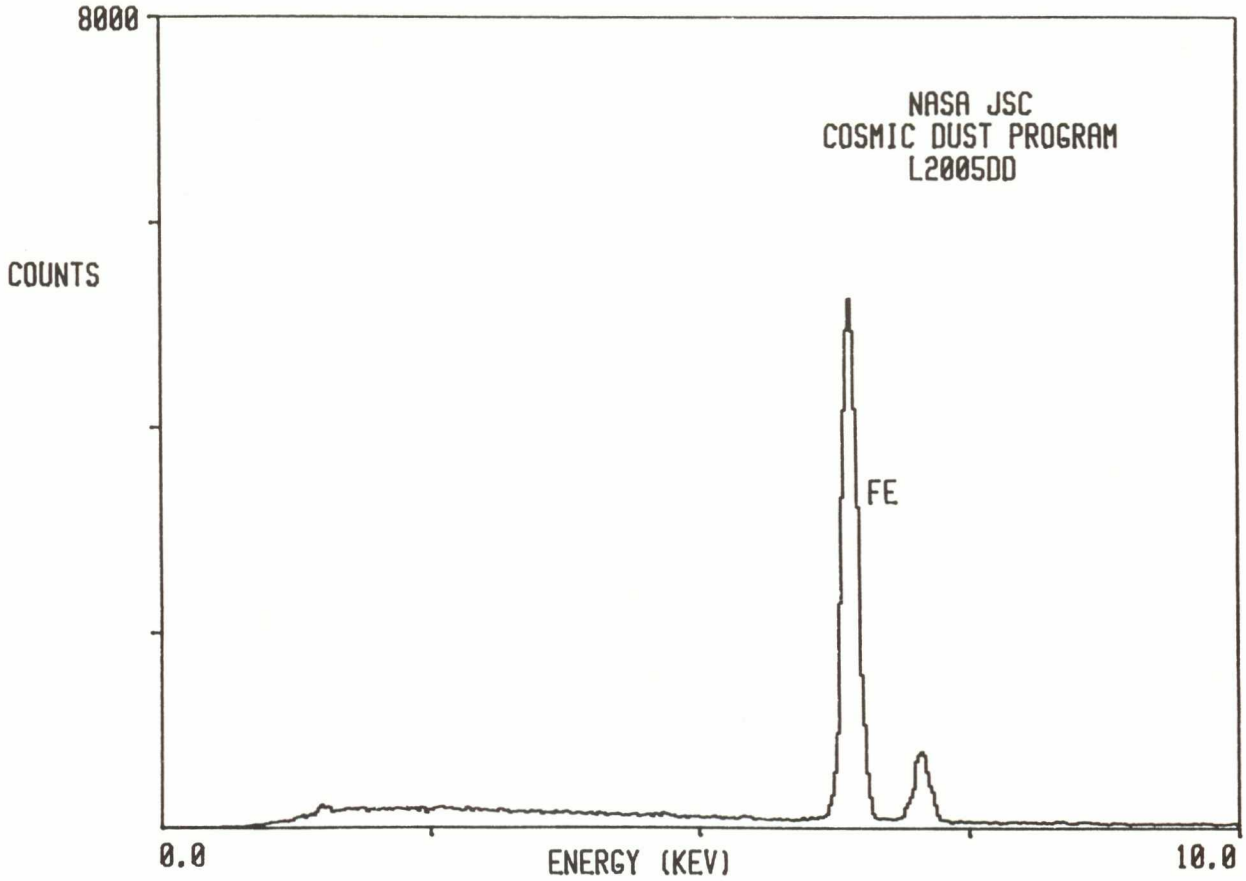
TRANS.: O

COLOR: Black

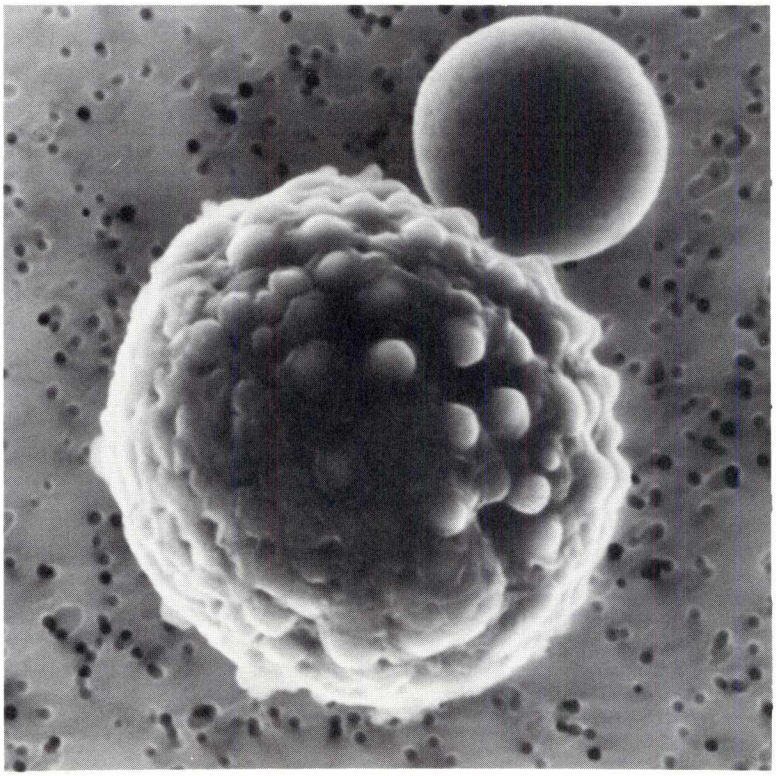
LUSTER: M

TYPE: C?

COMMENTS:



L2005 AD 7



S-92-35020

SIZE: 13

SHAPE: S

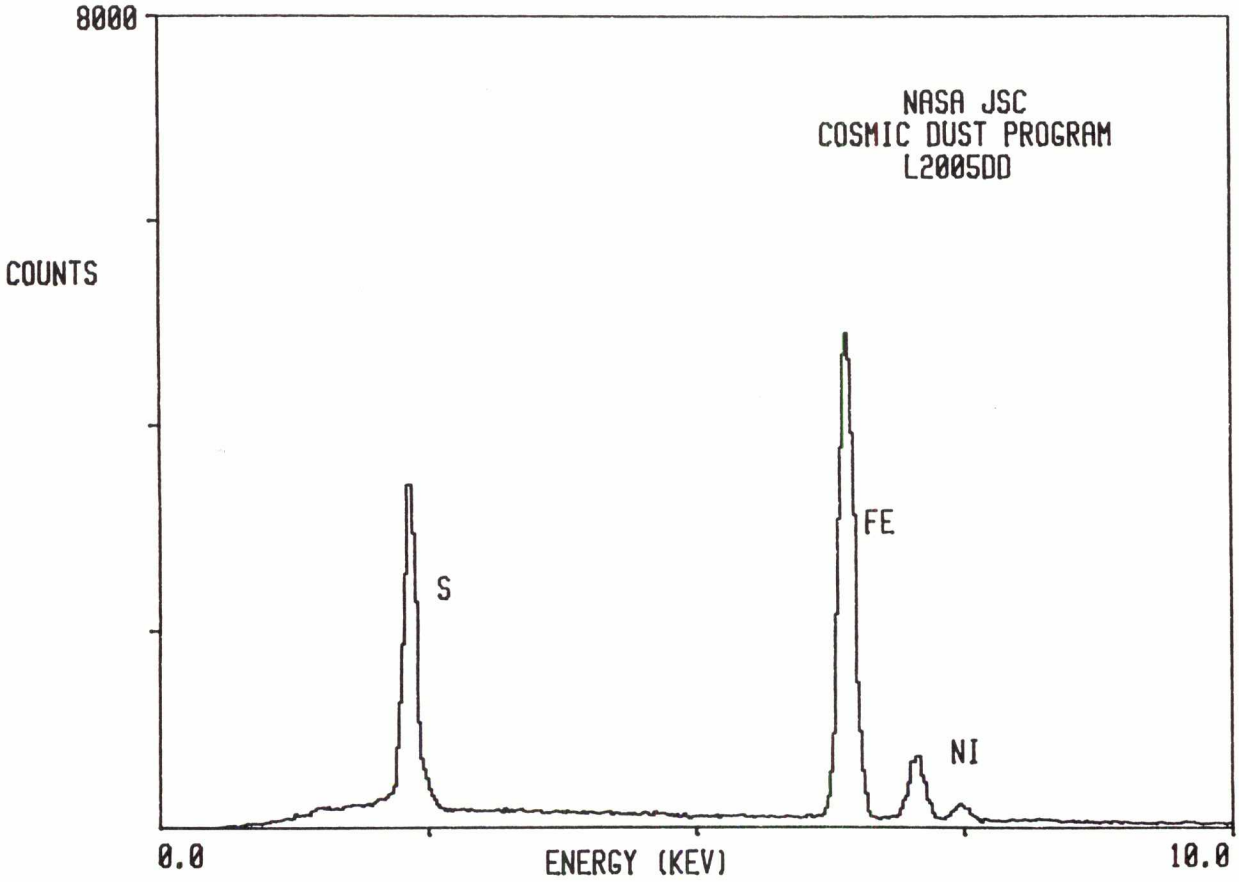
TRANS.: O

COLOR: Black

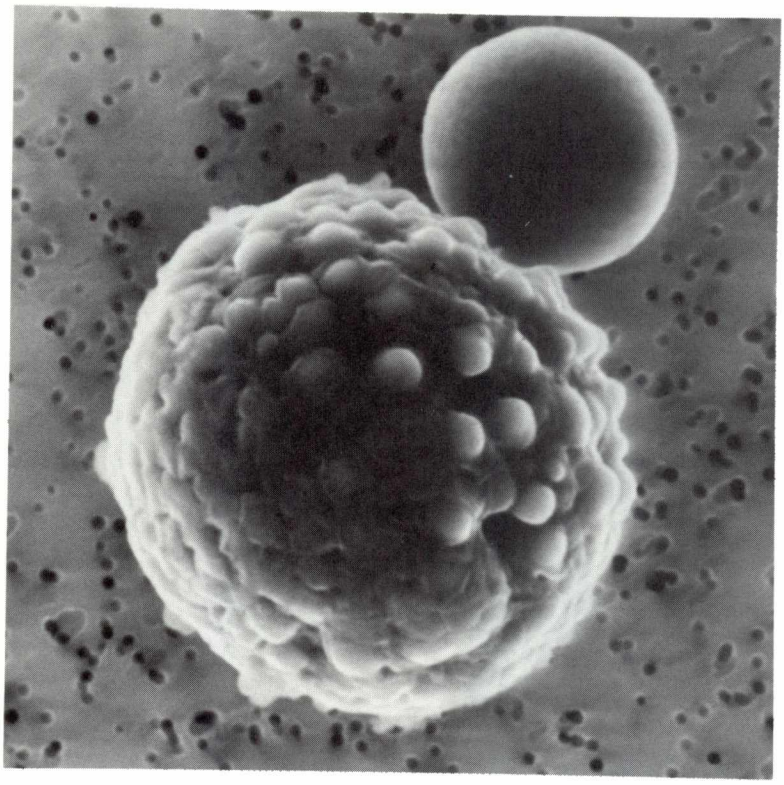
LUSTER: M

TYPE: C

COMMENTS:
Larger sphere



L2005 AD 7



SIZE: 5

SHAPE: S

TRANS.: O

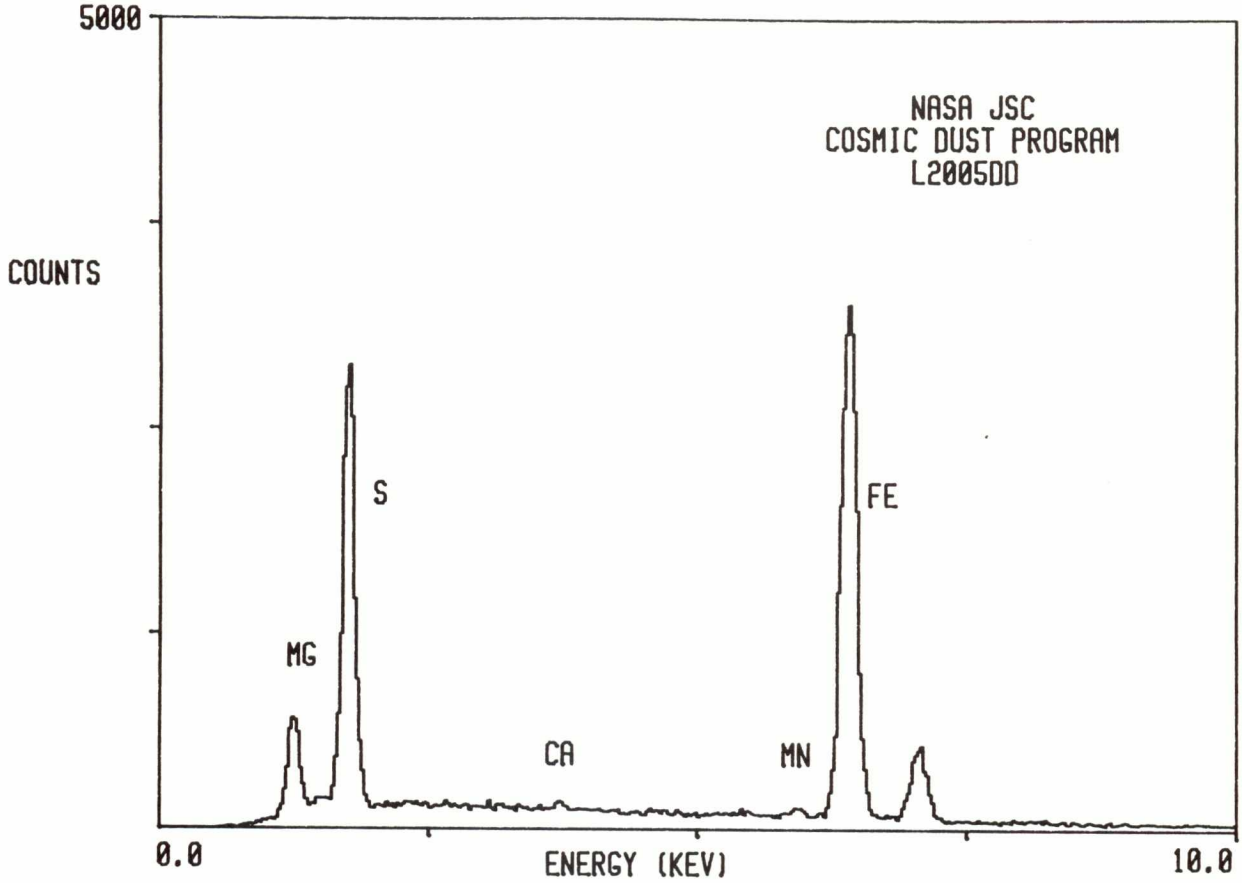
COLOR: Black

LUSTER: M

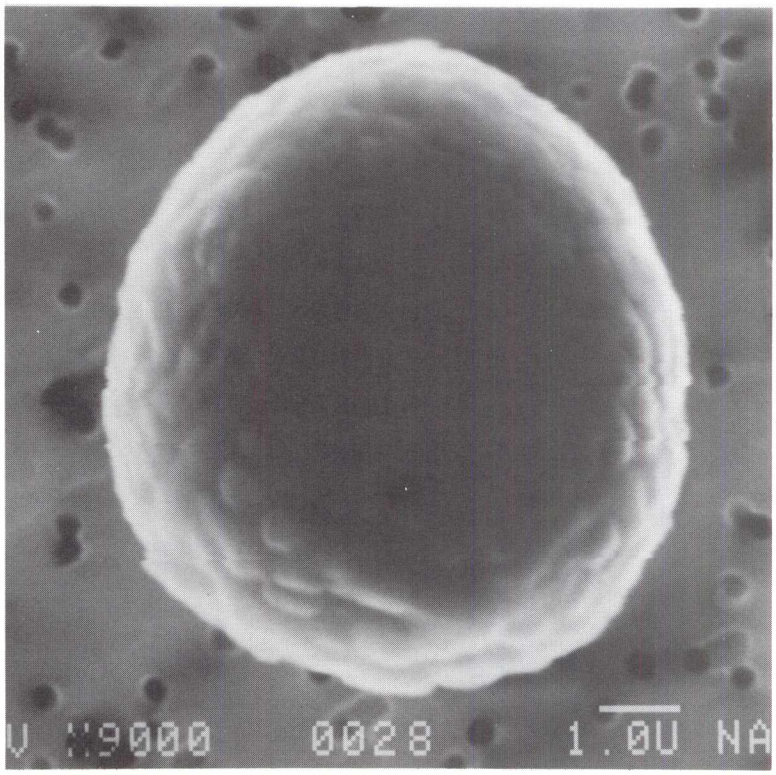
TYPE: C

COMMENTS:
Smaller sphere

S-92-35020



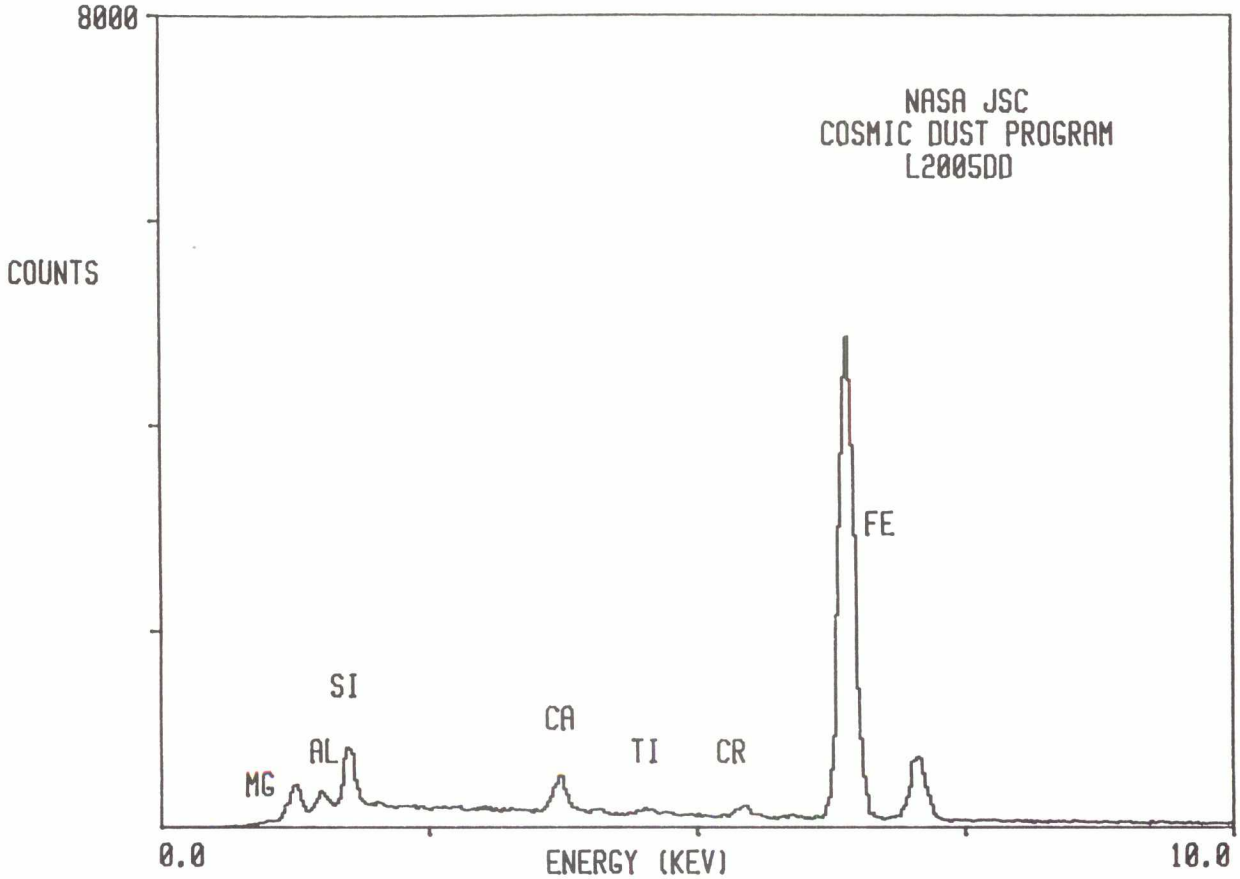
L2005 AD 8



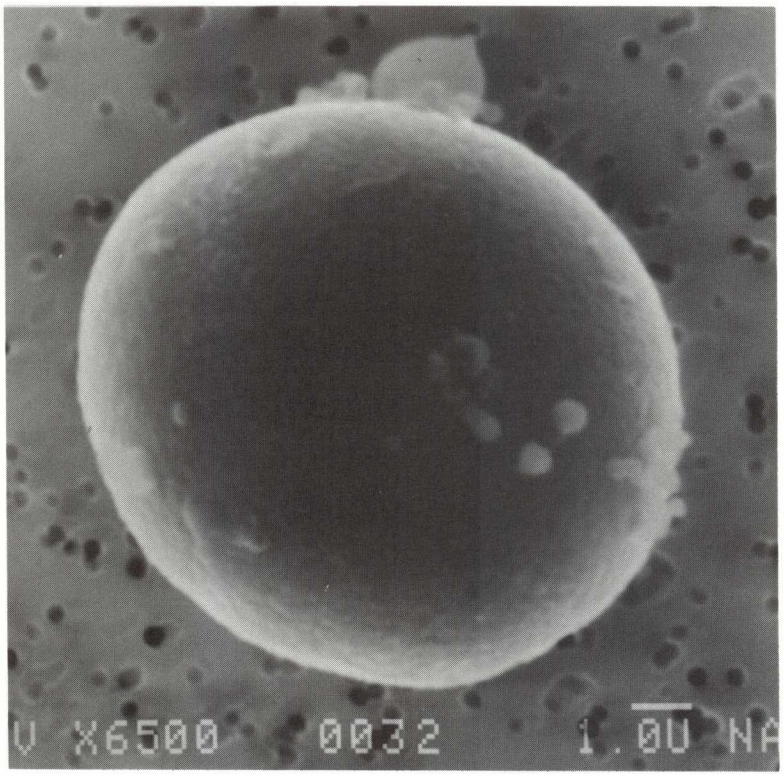
S-92-35908

SIZE: 8
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C?

COMMENTS:



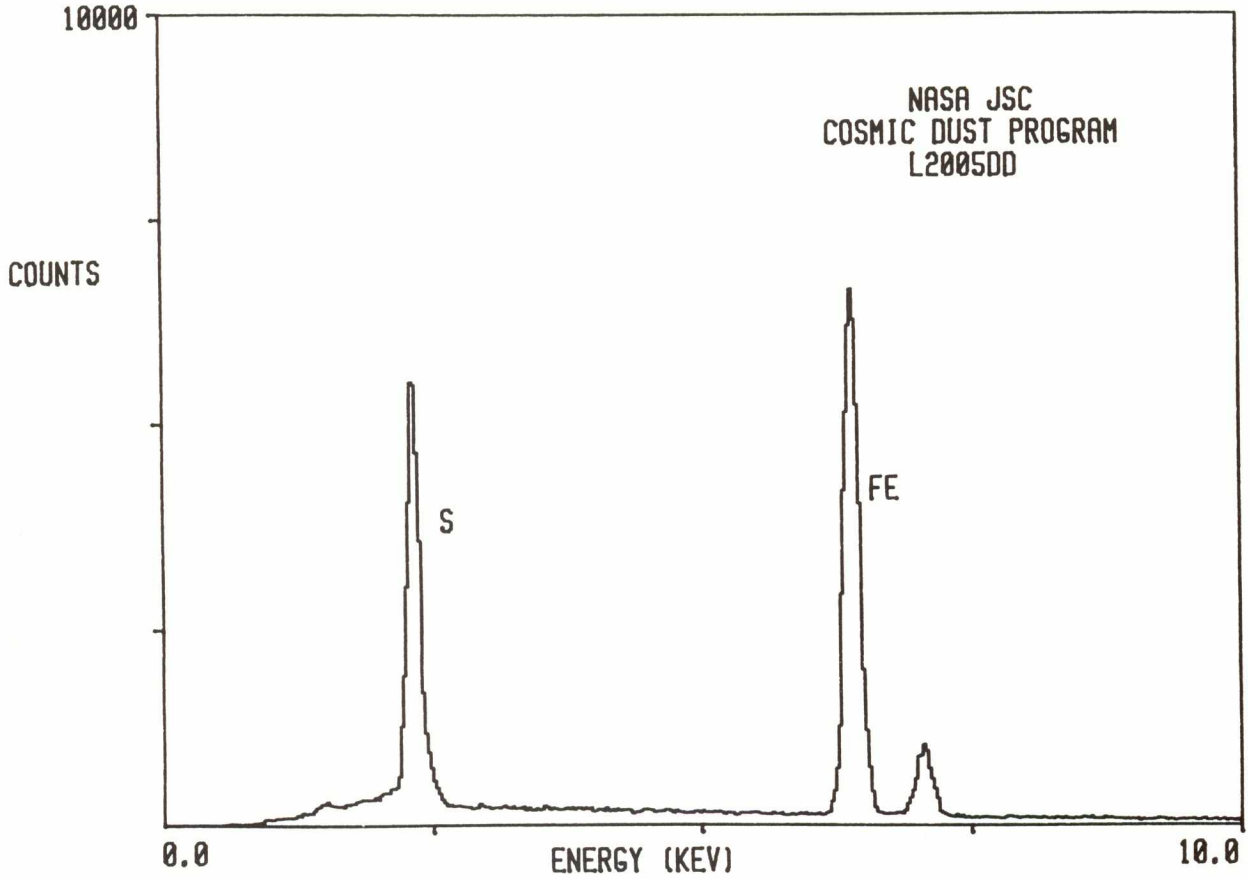
L2005 AD 11



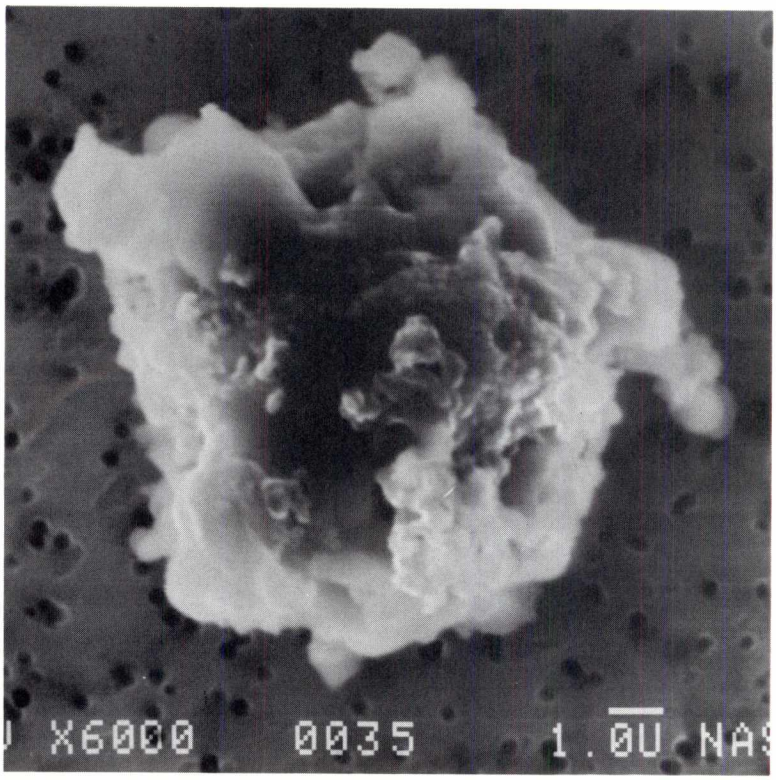
S-92-35911

SIZE: 11
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



L2005 AD 14



S-92-35914

SIZE: 13x11

SHAPE: E

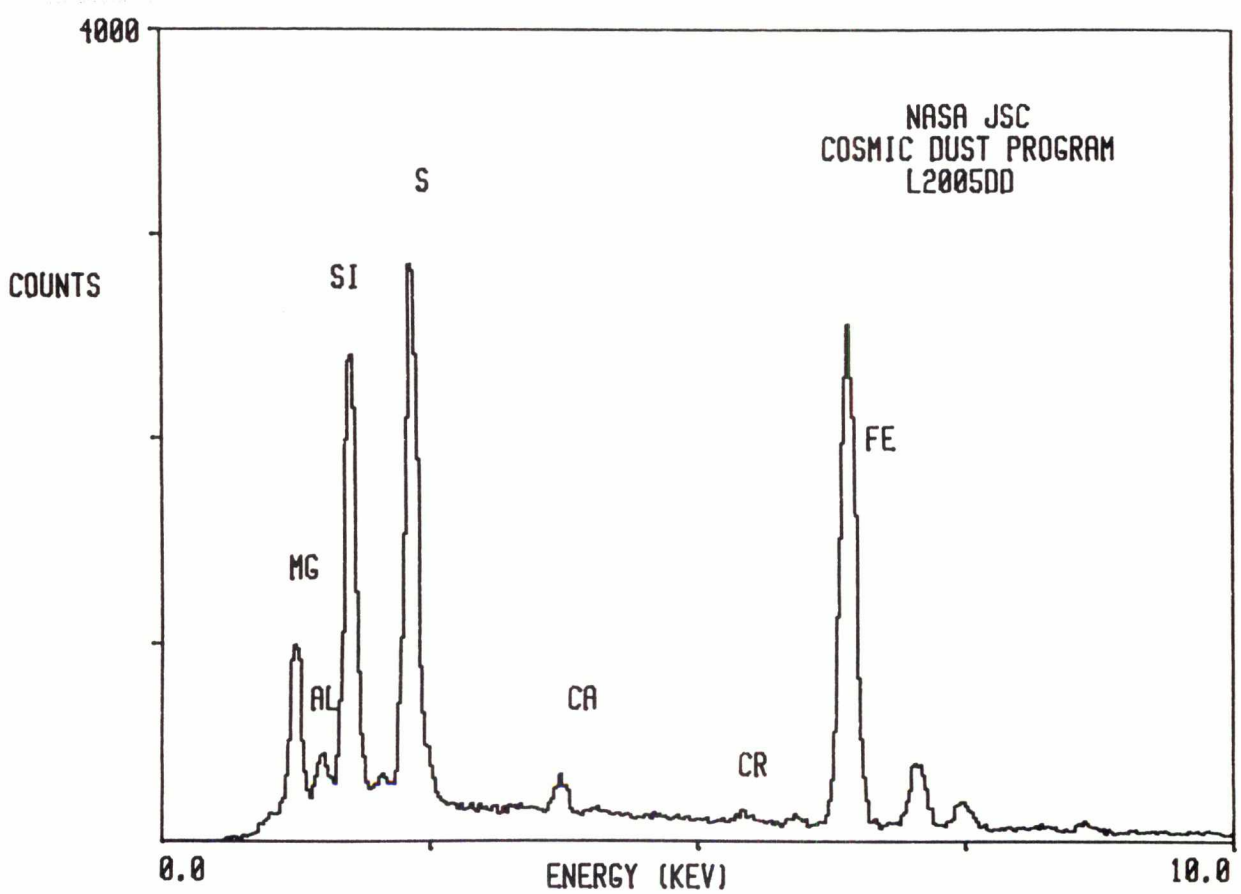
TRANS.: O

COLOR: Black

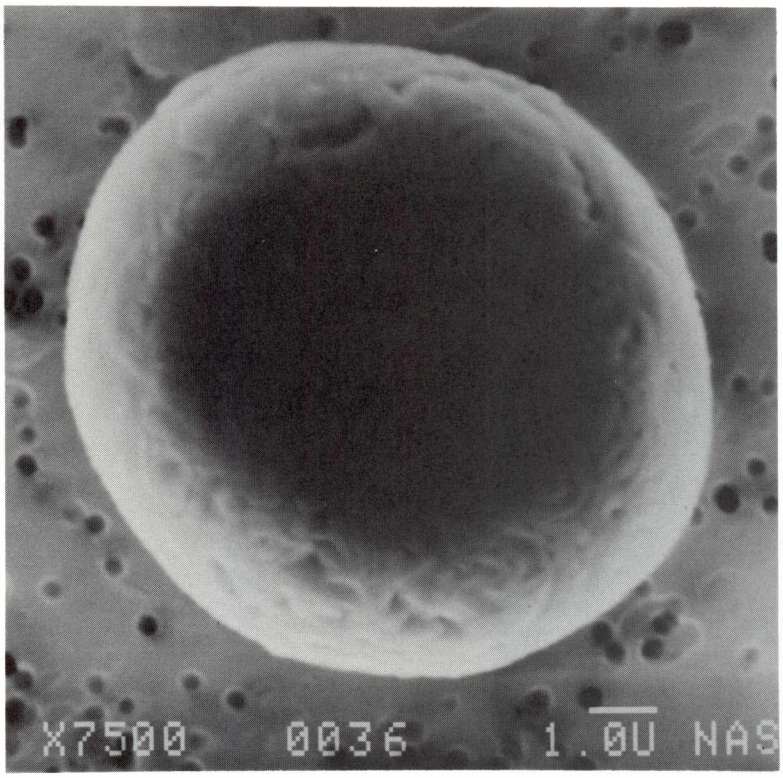
LUSTER: R

TYPE: C

COMMENTS:



L2005 AD 15



S-92-35915

SIZE: 10

SHAPE: S

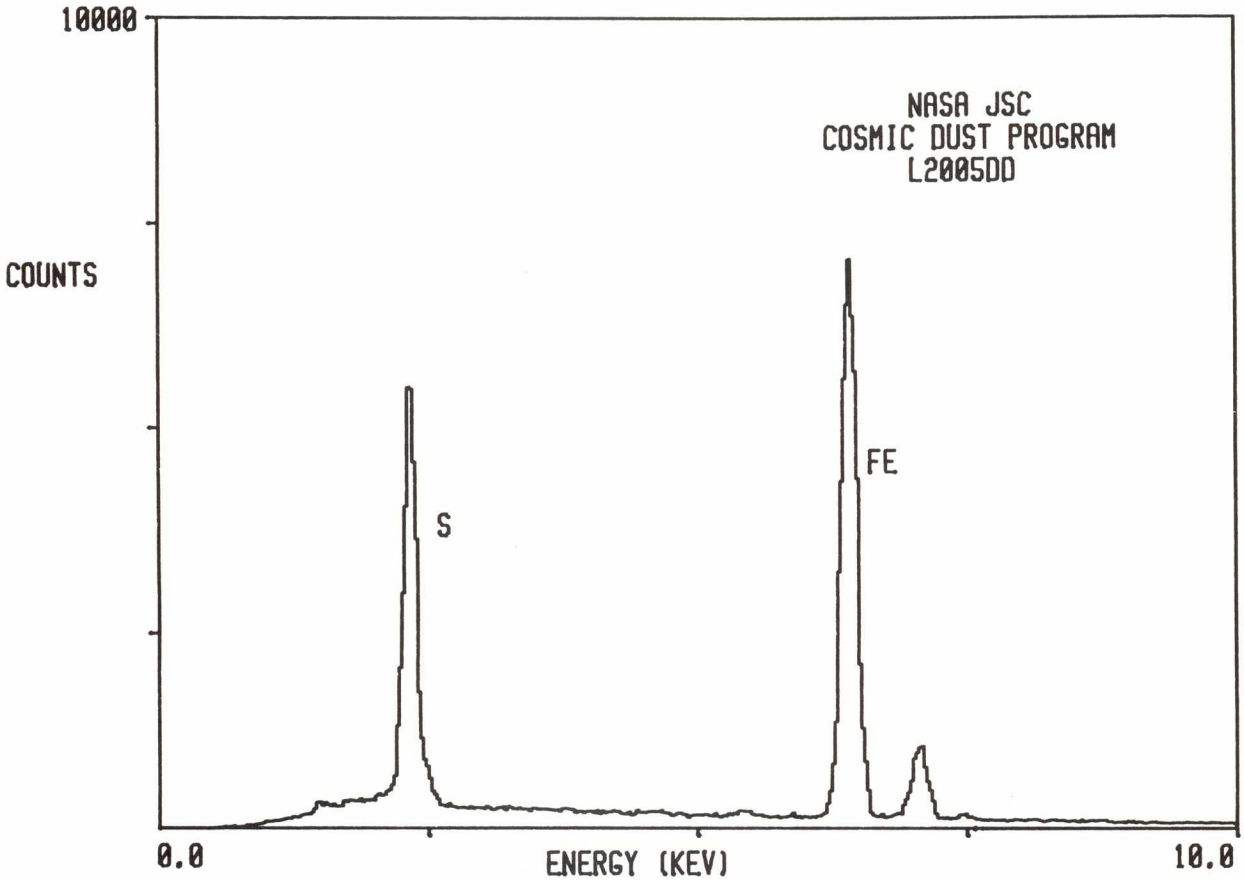
TRANS.: O

COLOR: Black

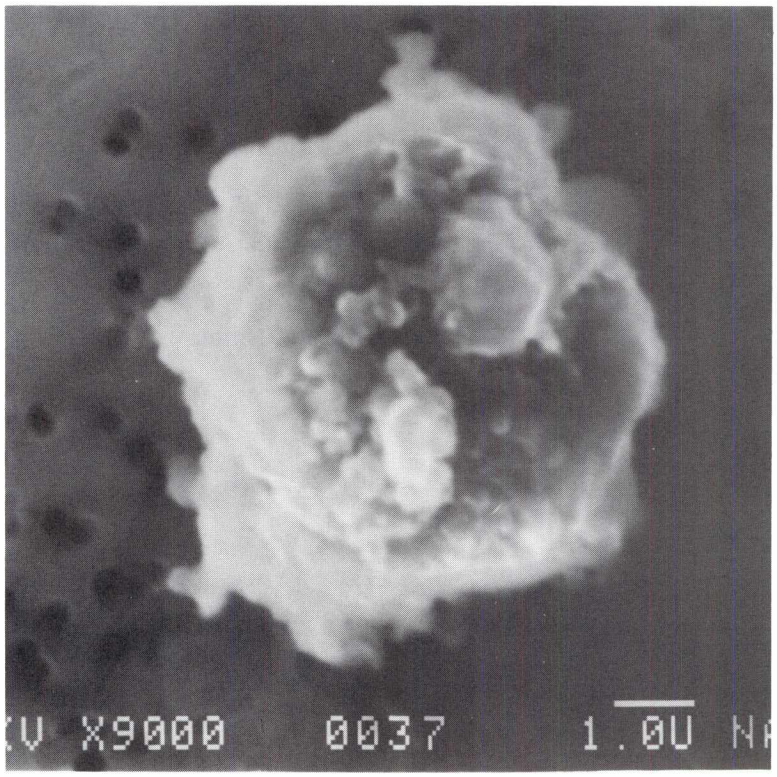
LUSTER: R

TYPE: C

COMMENTS:



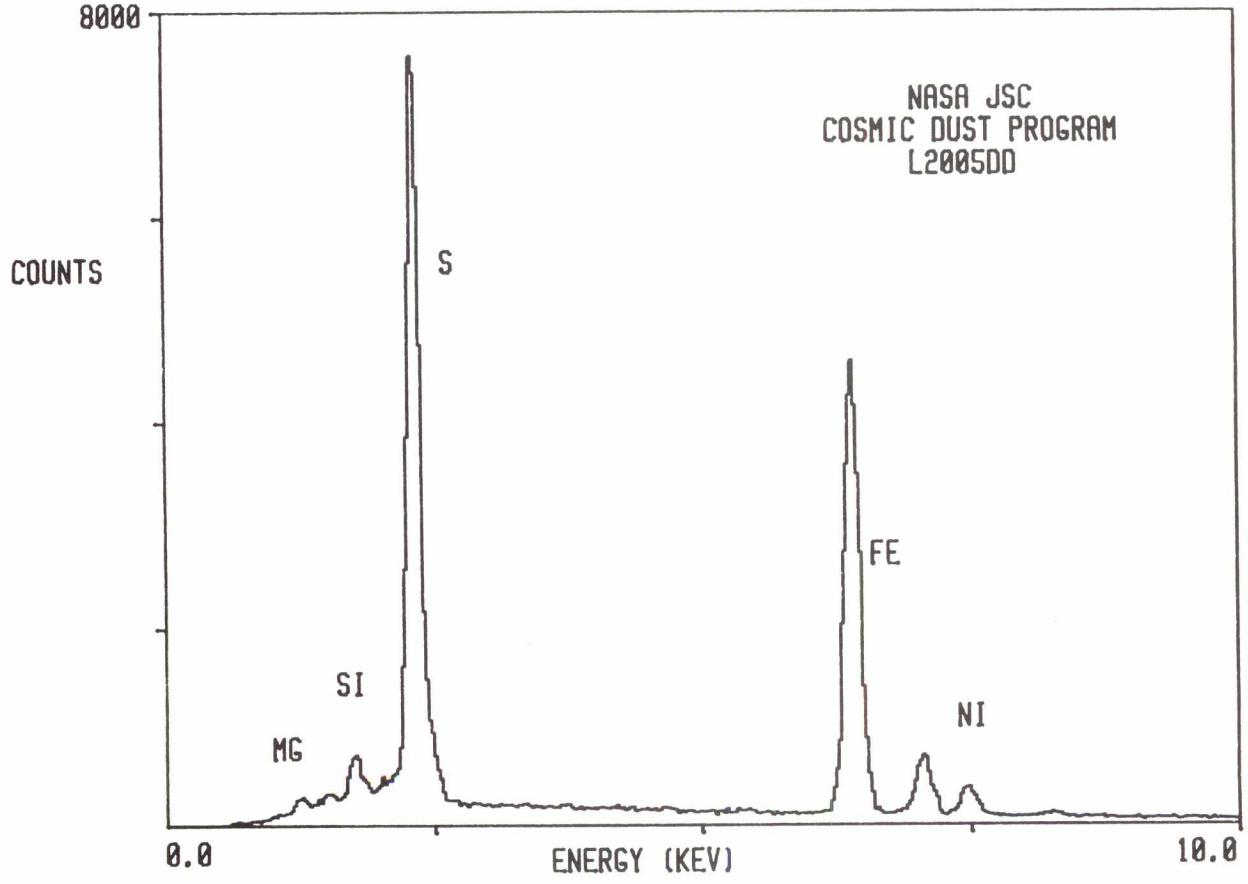
L2005 AD 16



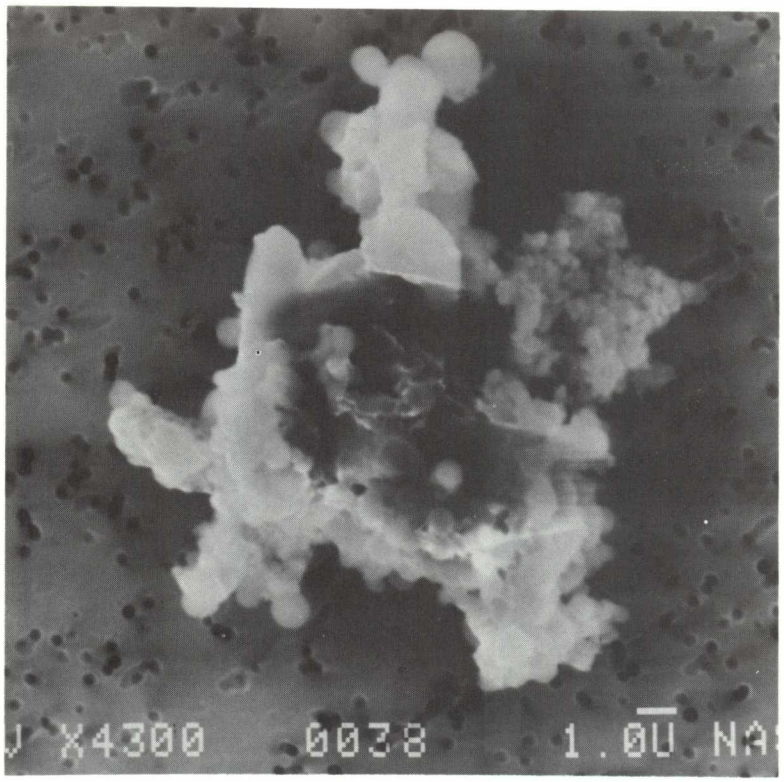
S-92-35916

SIZE: 7
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



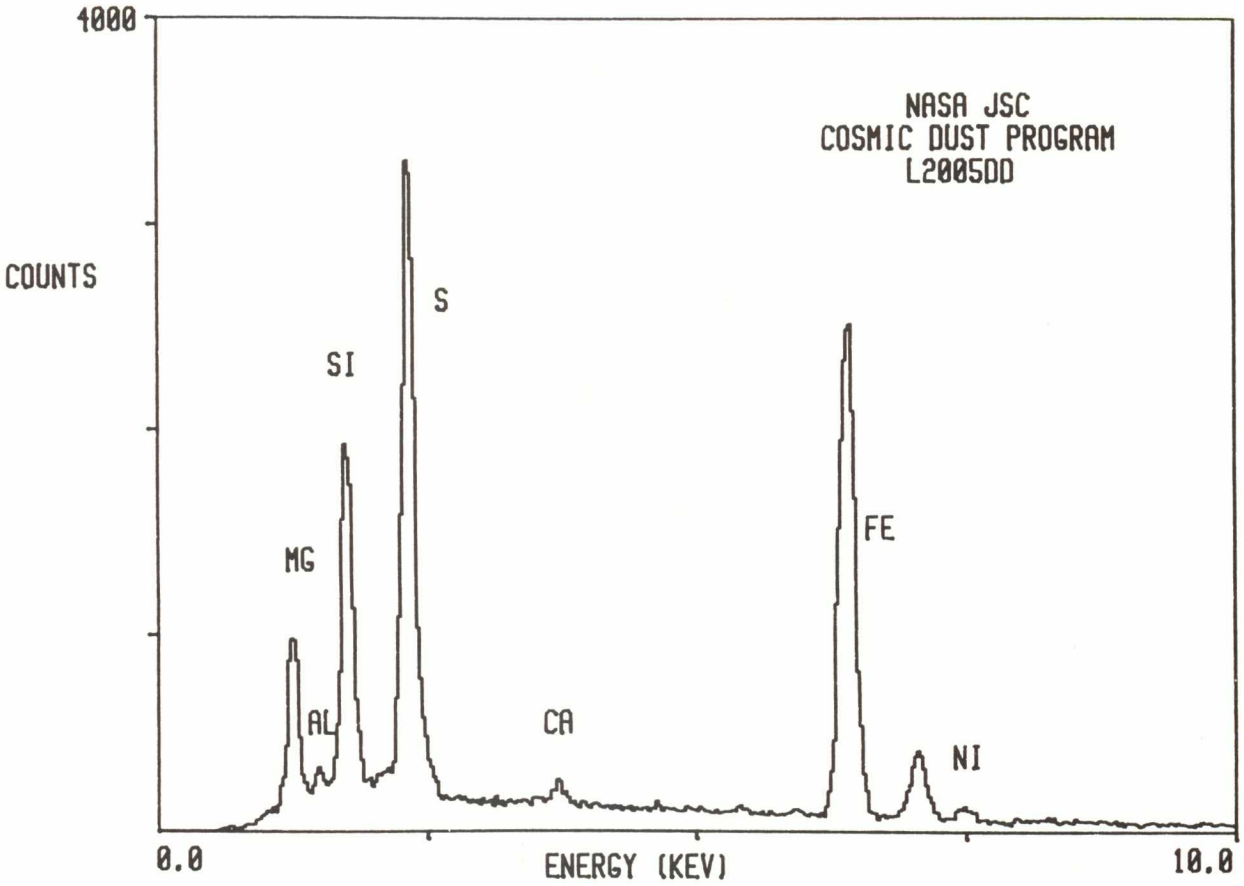
L2005 AD 17



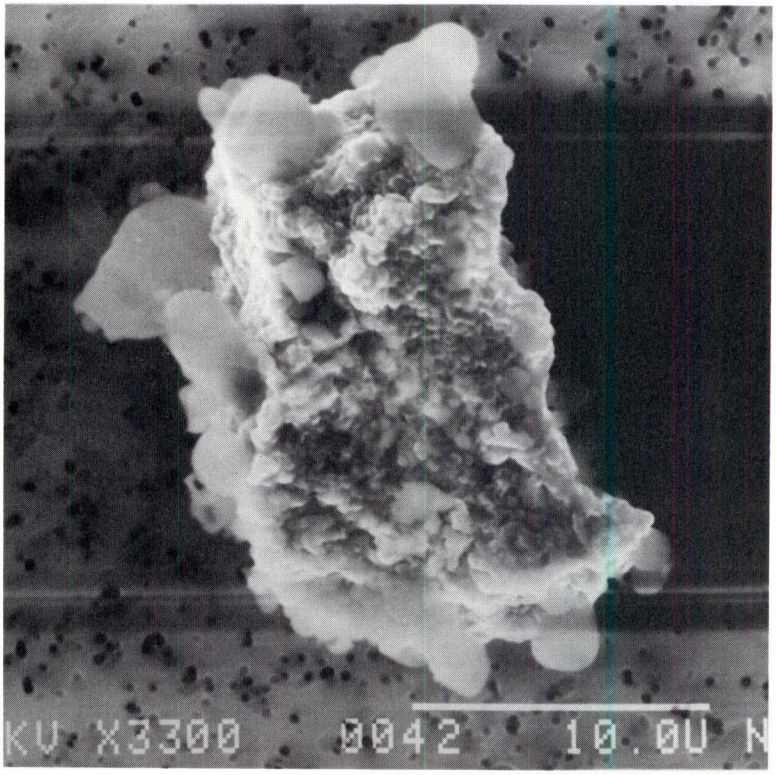
S-92-35917

SIZE: 16x12
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



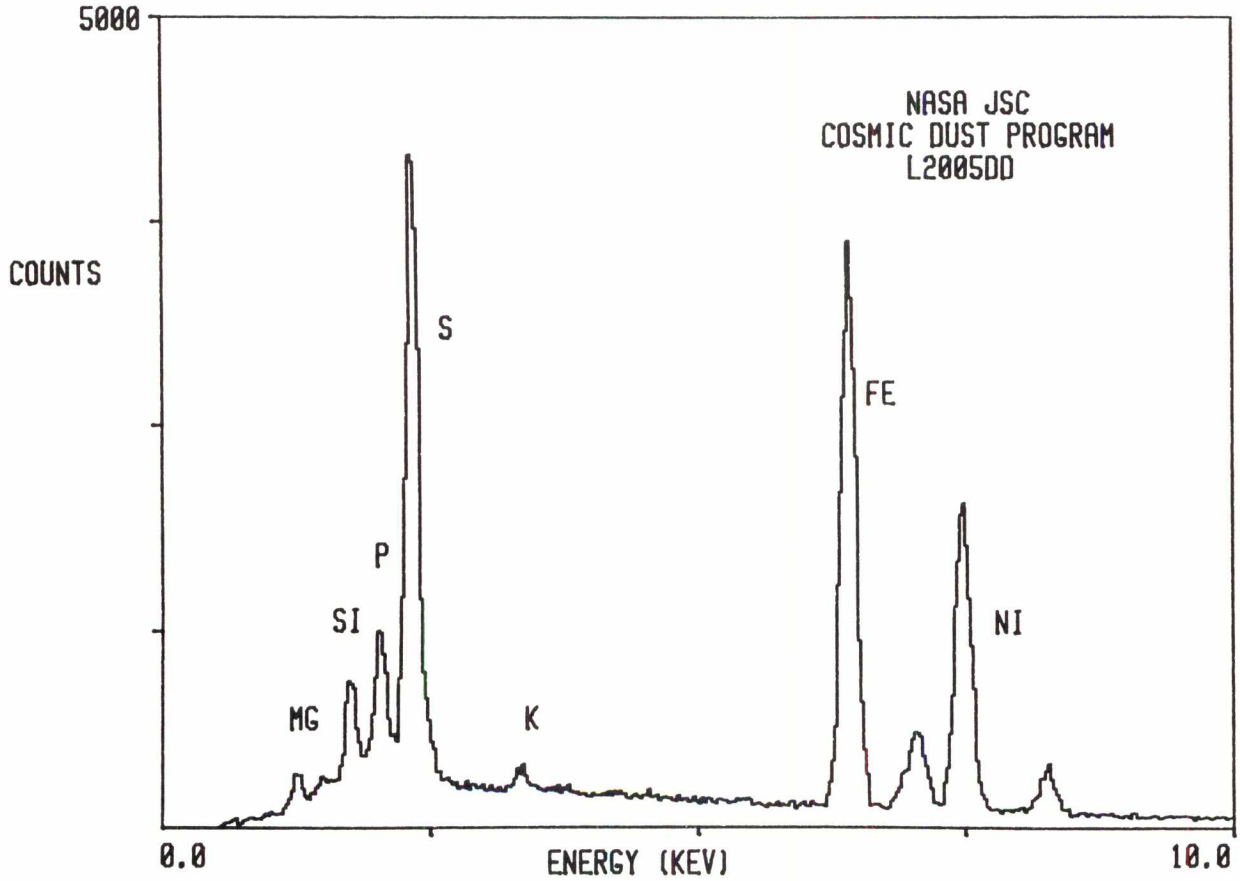
L2005 AD 18



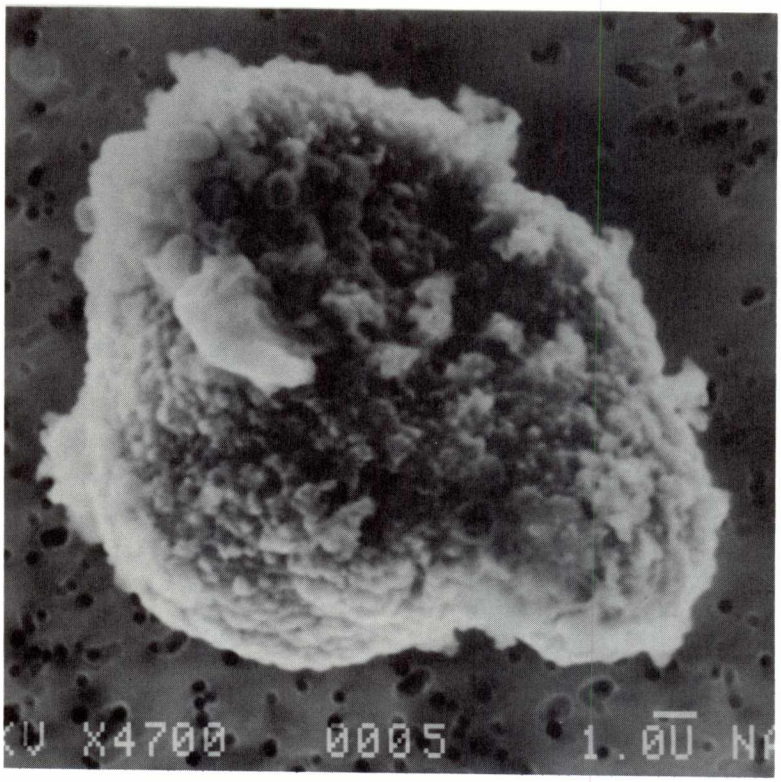
S-92-35918

SIZE: 22x15
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C?

COMMENTS:
K is high



L2005 AD 21



S-92-35921

SIZE: 16x13

SHAPE: I

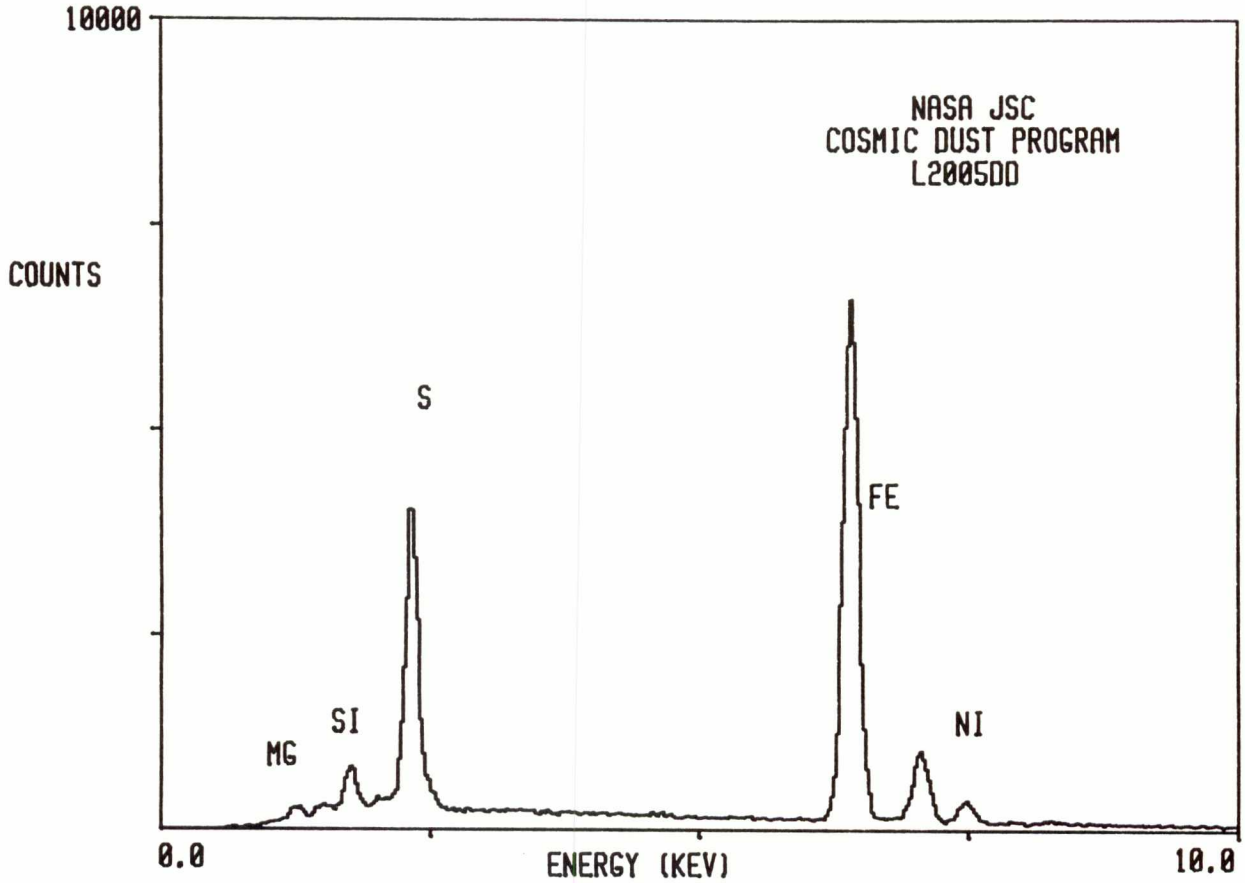
TRANS.: O

COLOR: Black to White

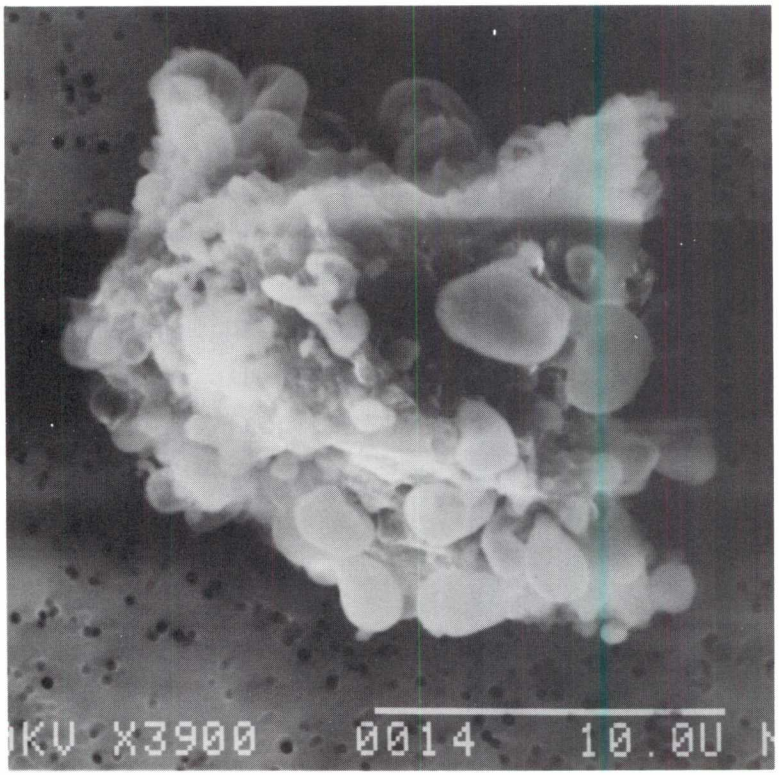
LUSTER: D

TYPE: C

COMMENTS:



L2005 AD 25



S-92-35925

SIZE: 19x15

SHAPE: E

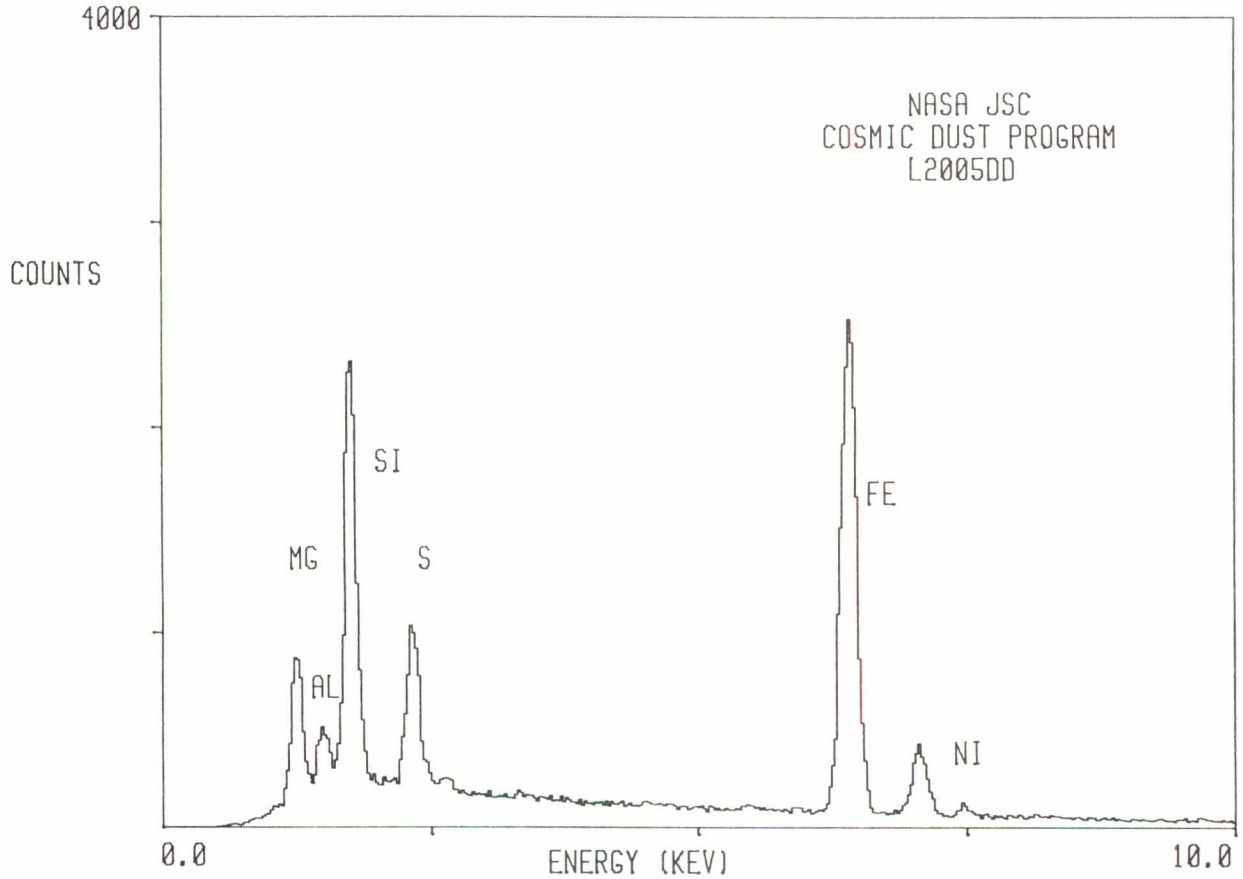
TRANS.: O

COLOR: Black

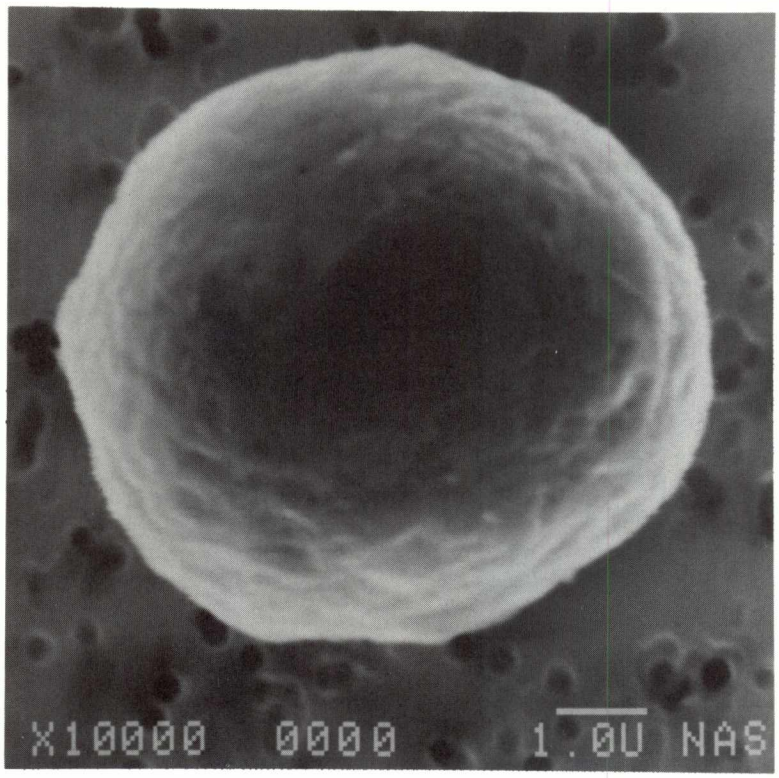
LUSTER: R

TYPE: C

COMMENTS:



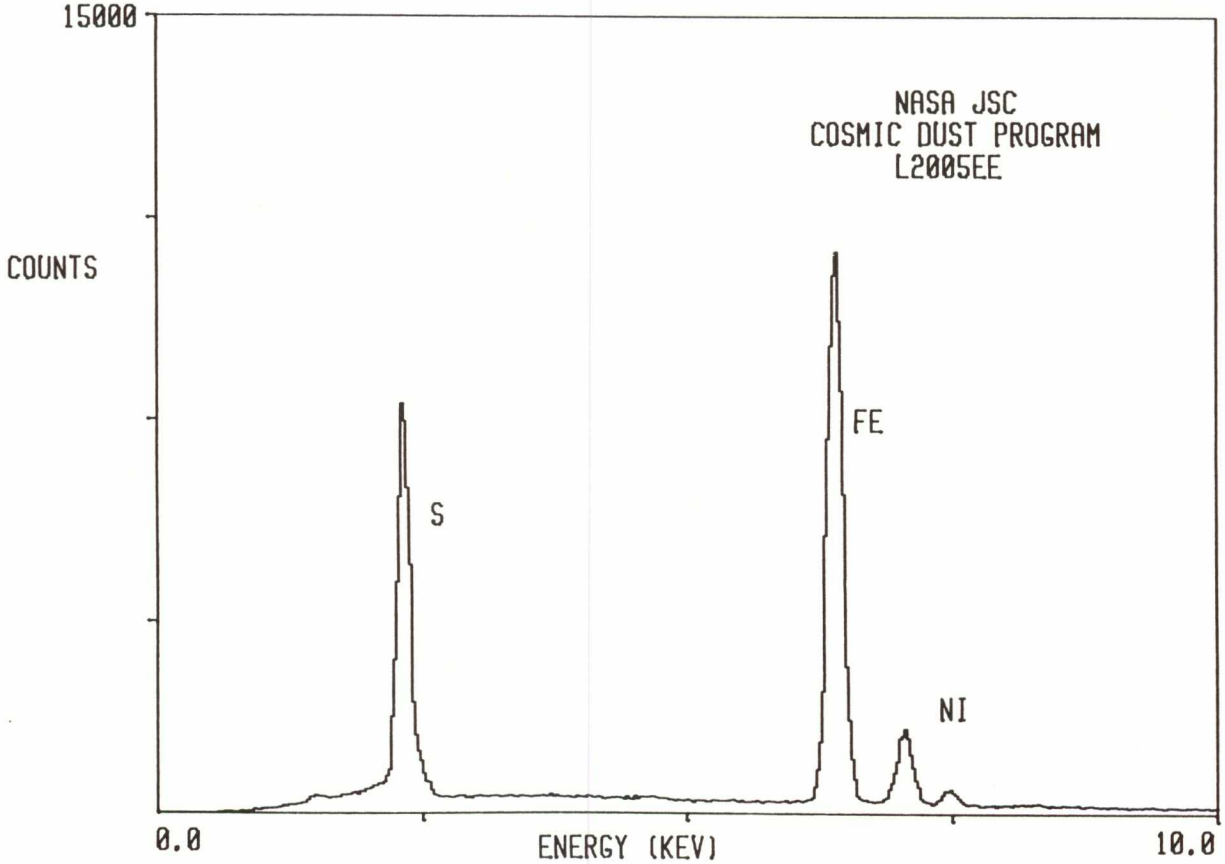
L2005 AE 1



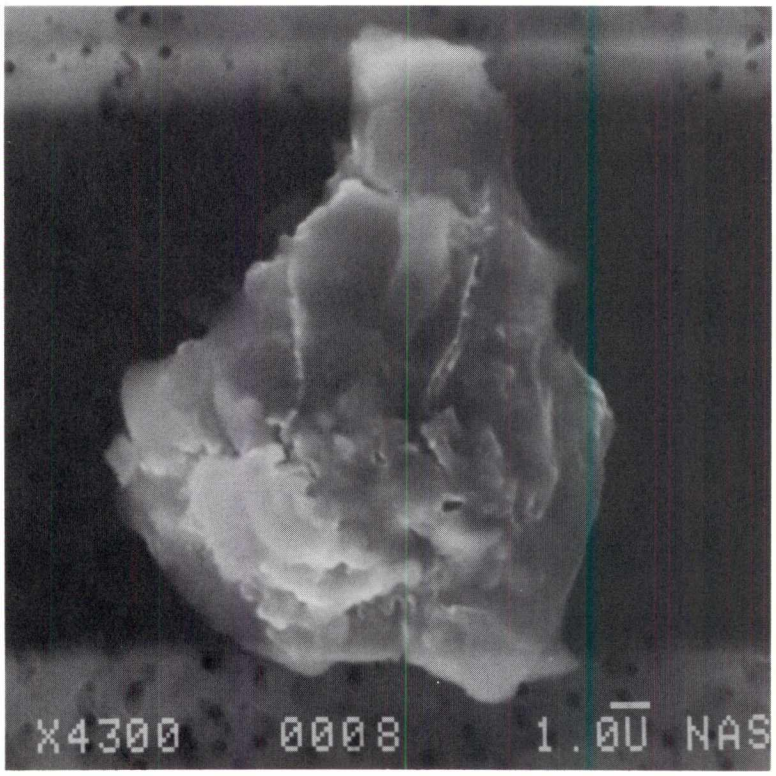
S-92-35886

SIZE: 6
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



L2005 AE 4



S-92-35889

SIZE: 17x15

SHAPE: I

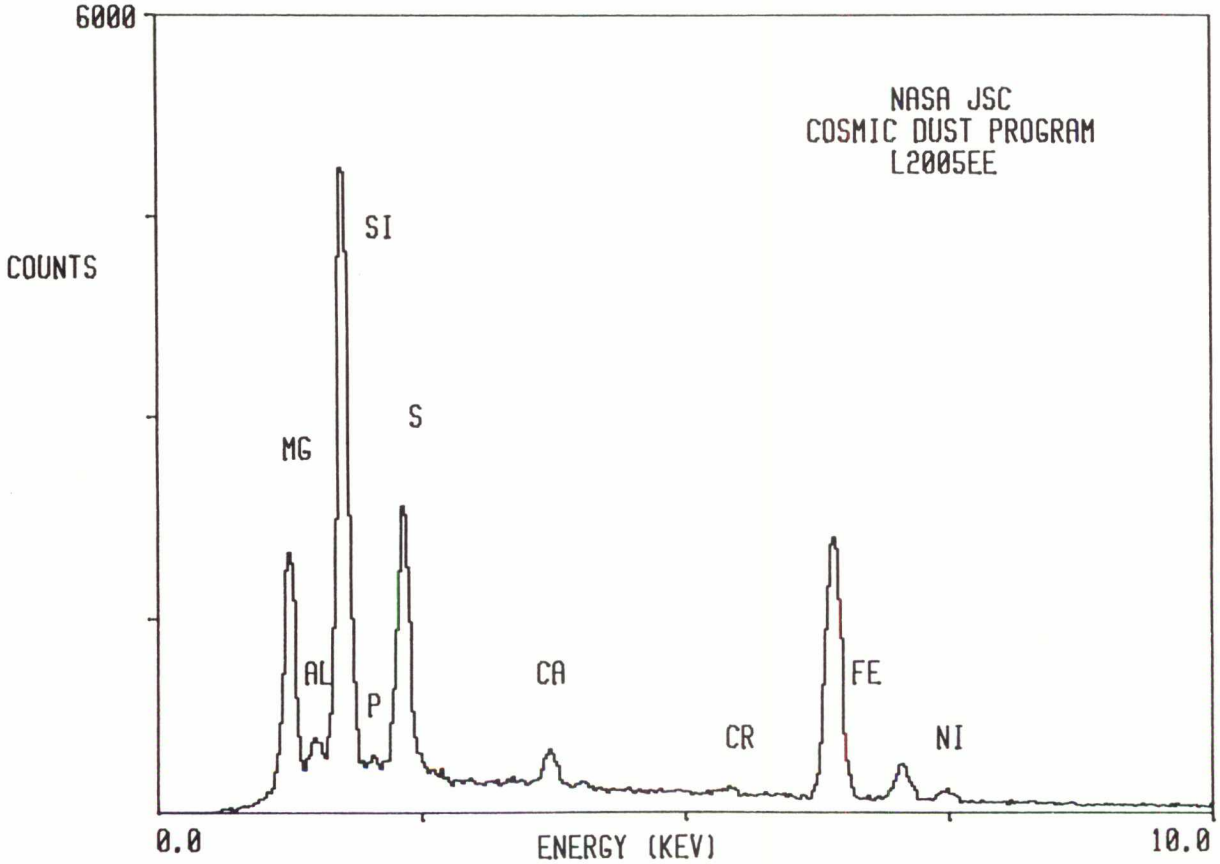
TRANS.: O

COLOR: Black

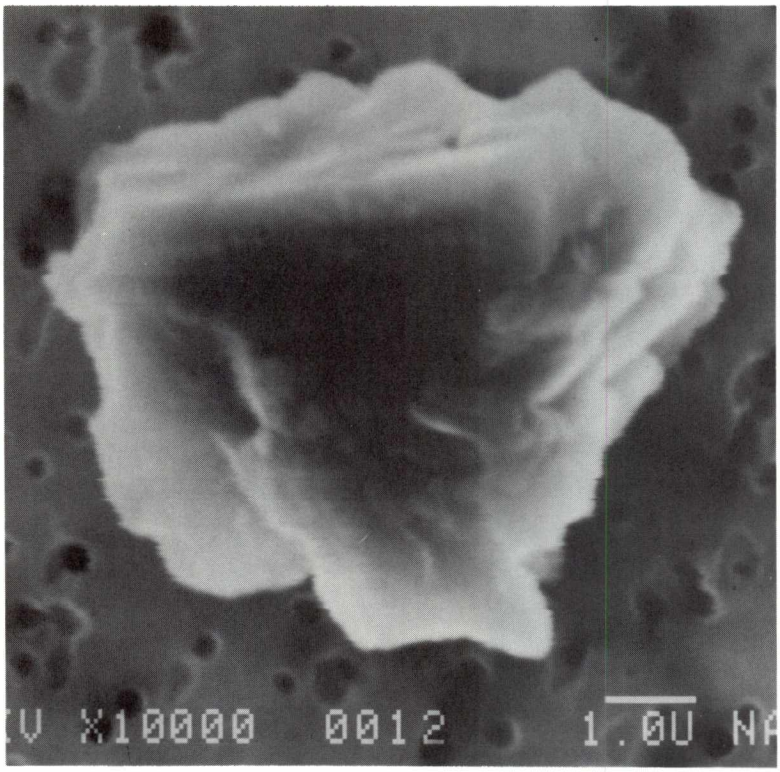
LUSTER: D

TYPE: C

COMMENTS:



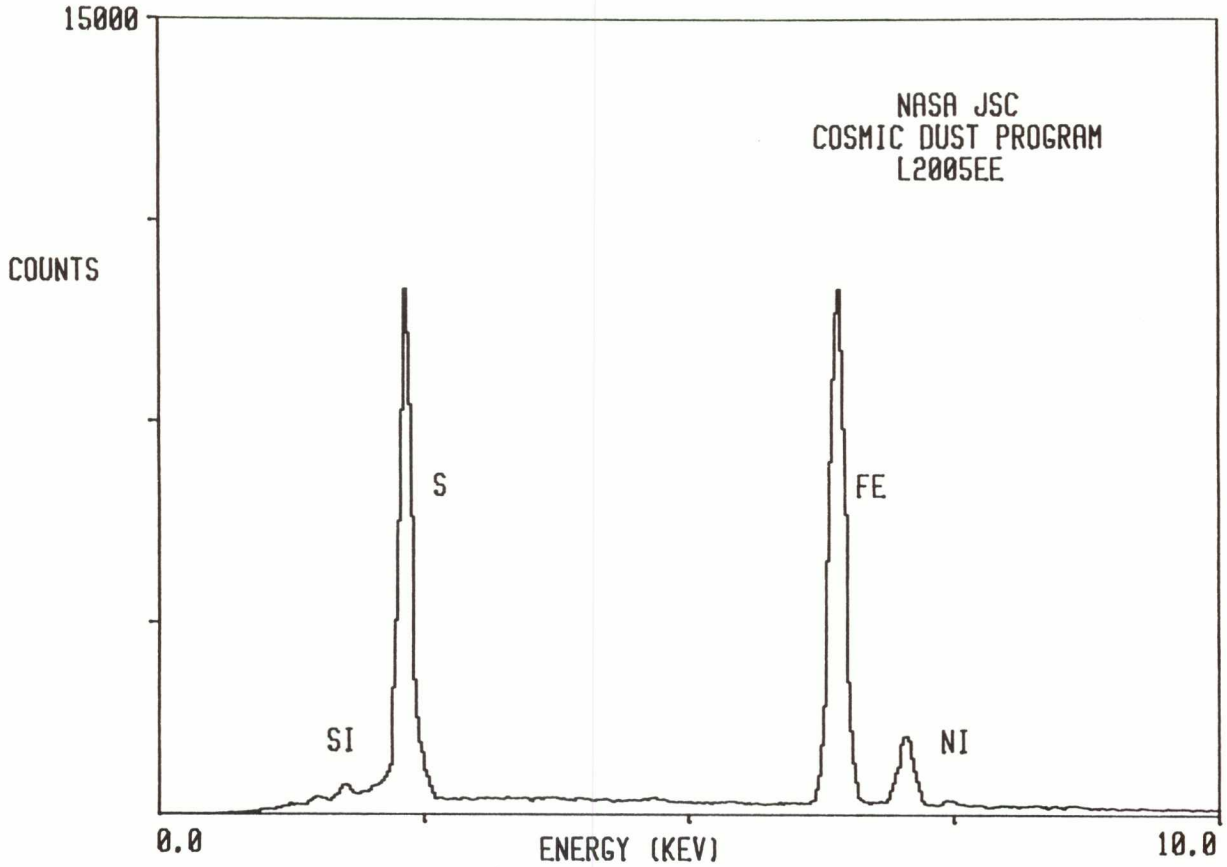
L2005 AE 6



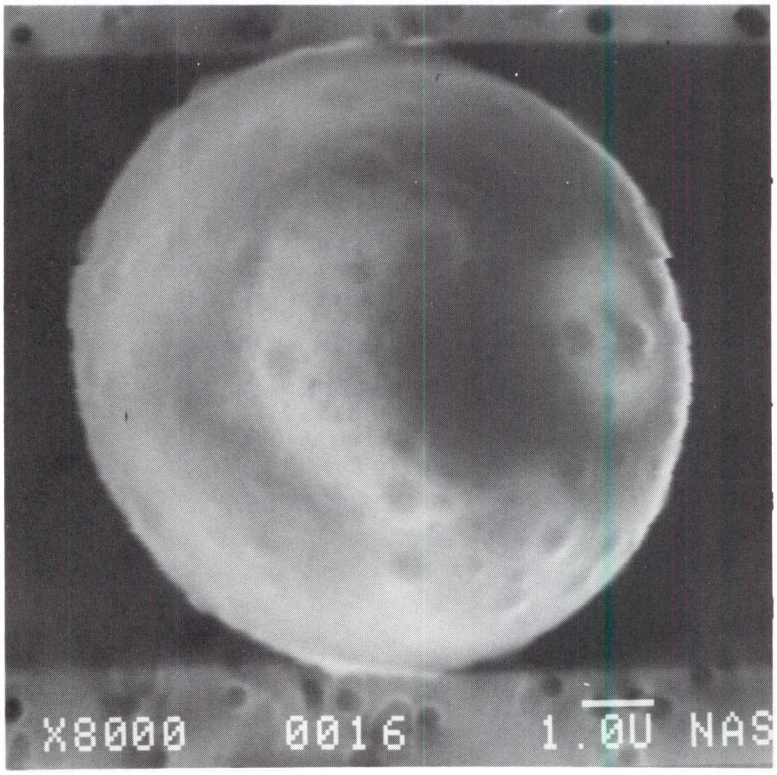
S-92-35891

SIZE: 8
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



L2005 AE 7



S-92-35892

SIZE: 10

SHAPE: S

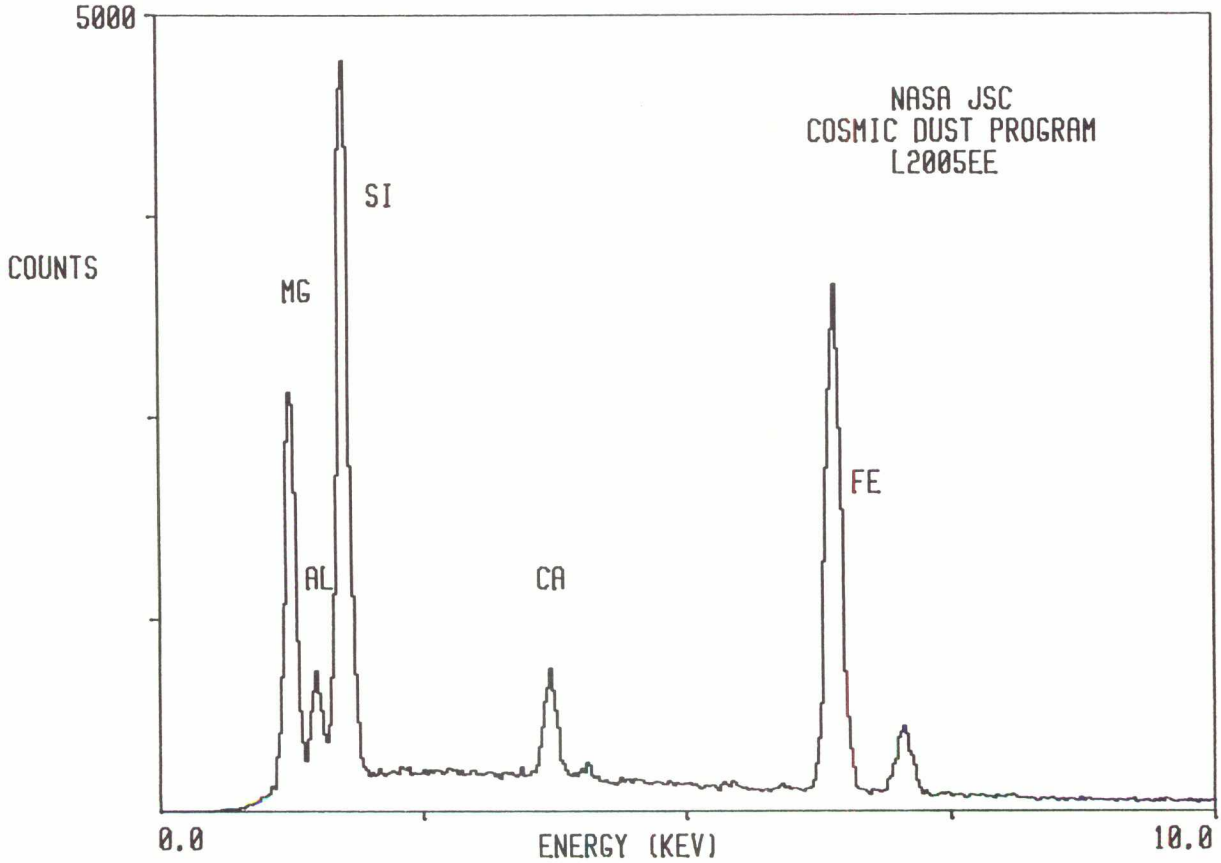
TRANS.: O

COLOR: Black

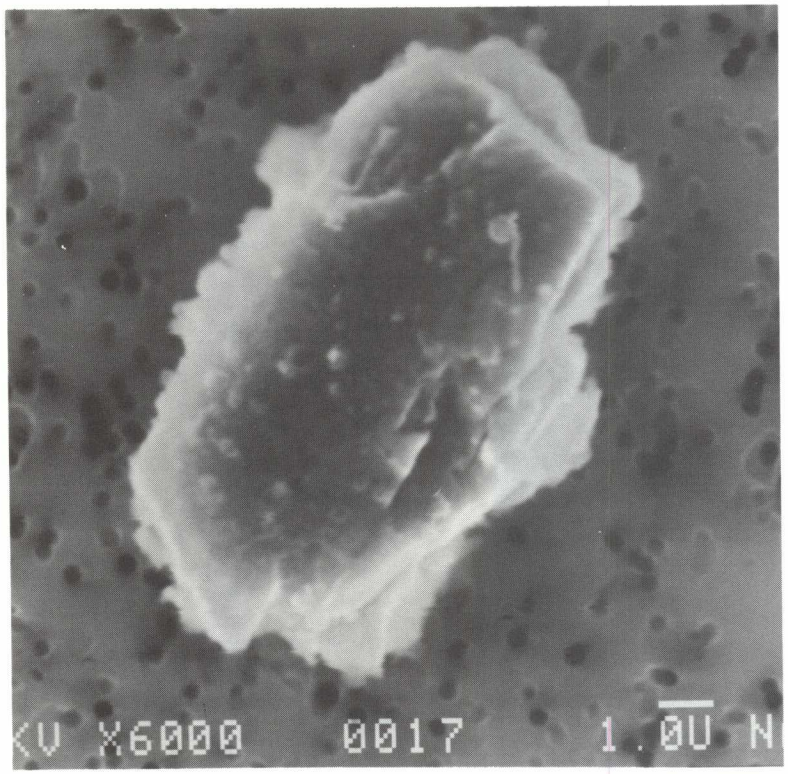
LUSTER: R

TYPE: C

COMMENTS:



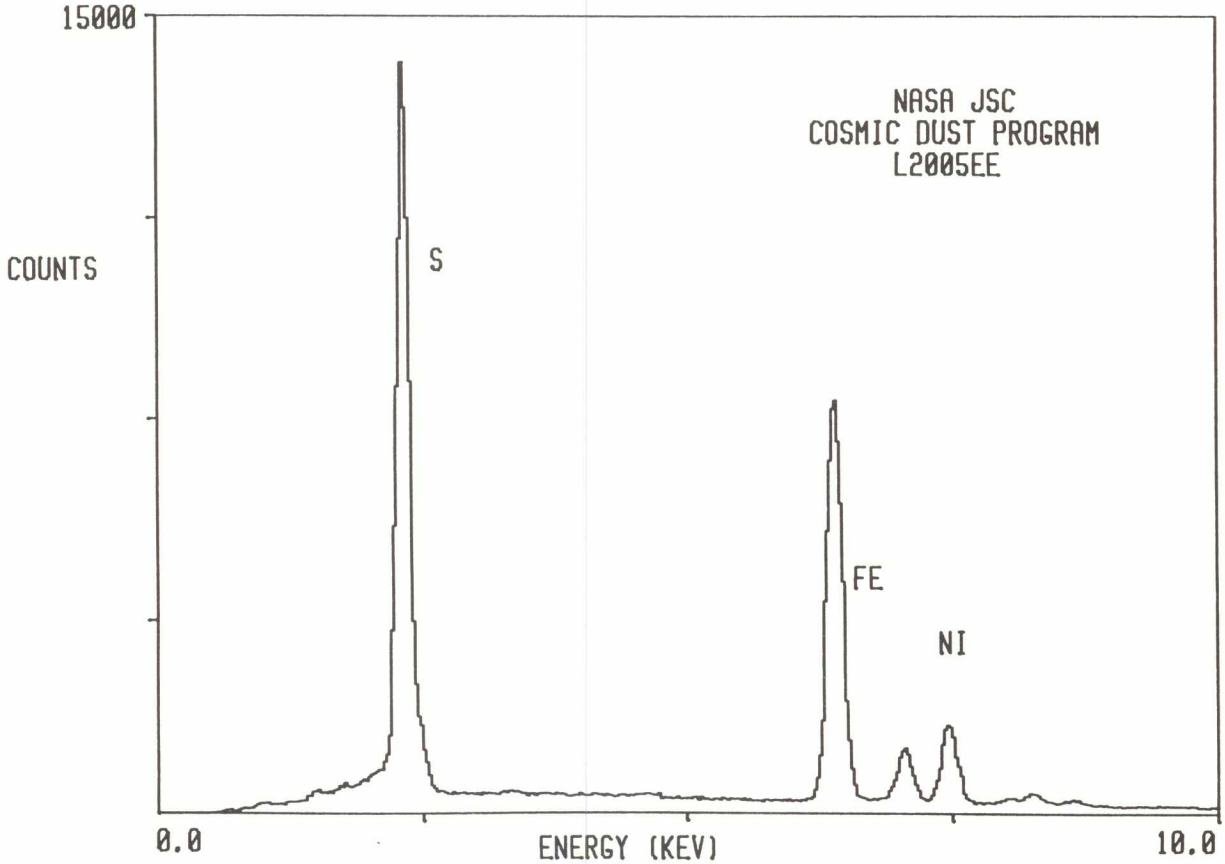
L2005 AE 8



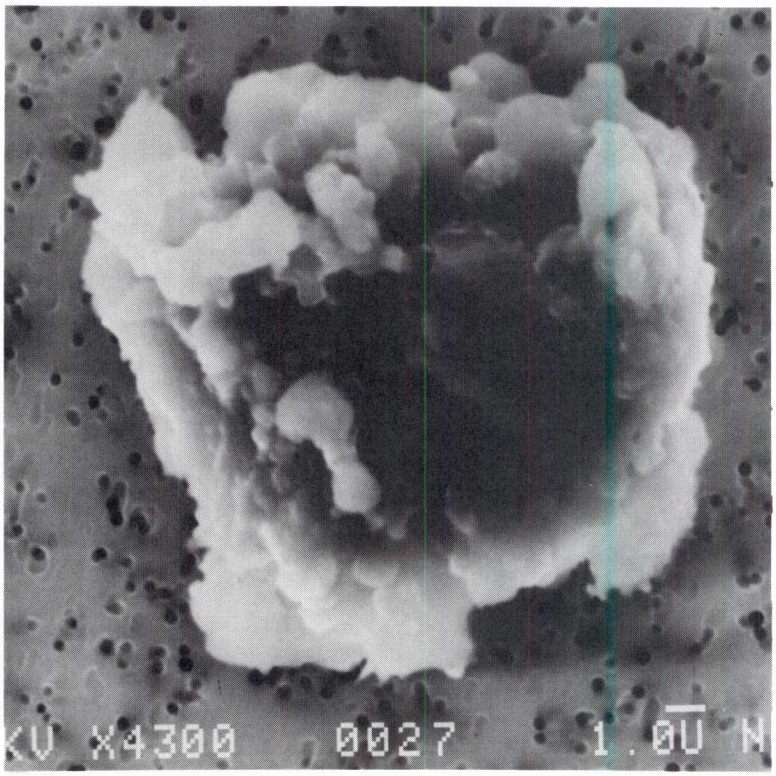
S-92-35893

SIZE: 12x6
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



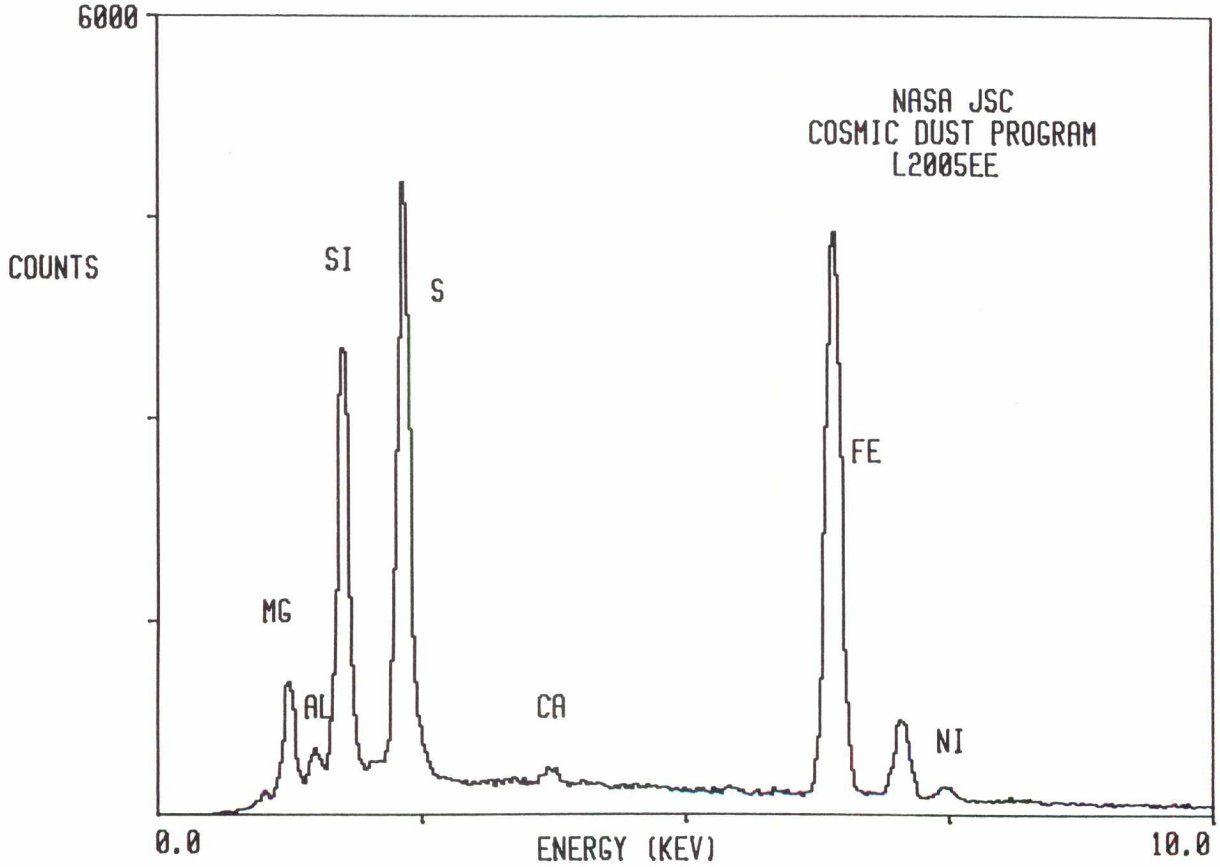
L2005 AE 11



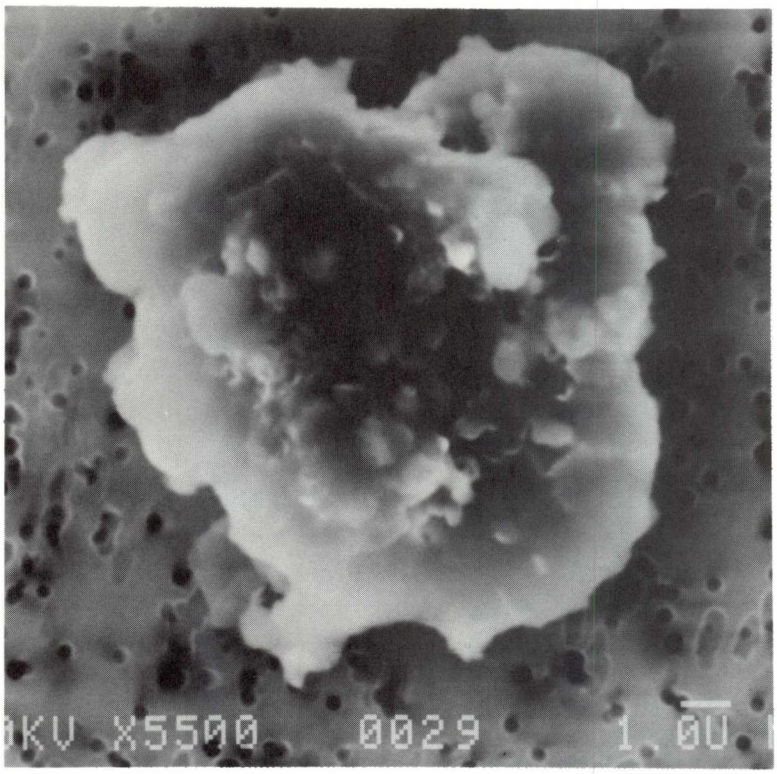
S-92-35901

SIZE: 17x15
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



L2005 AE 12



S-92-35896

SIZE: 13x11

SHAPE: I

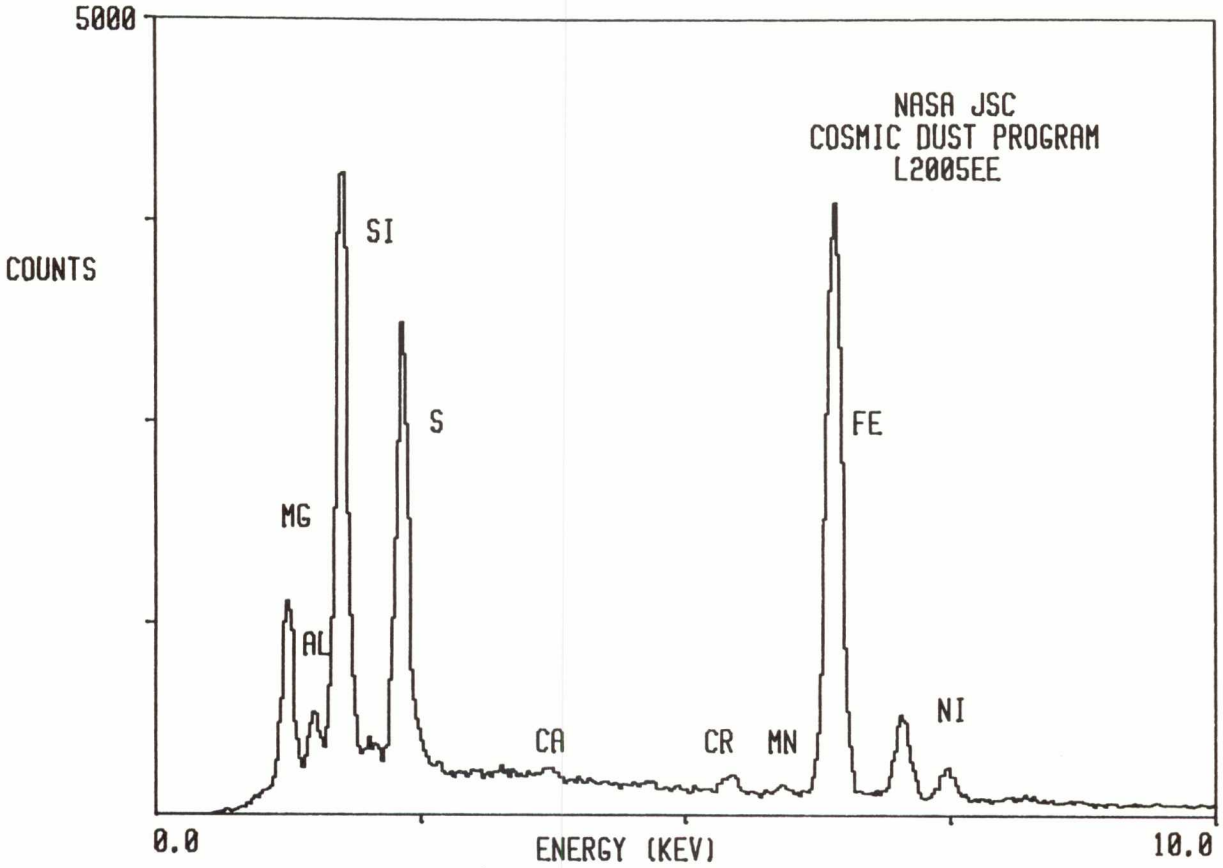
TRANS.: O

COLOR: Black

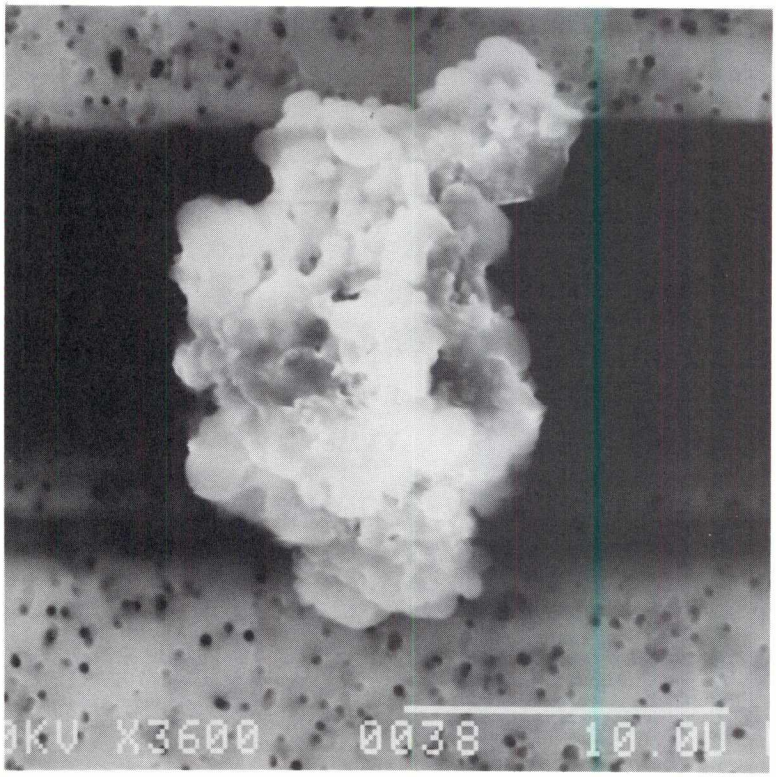
LUSTER: D

TYPE: C

COMMENTS:



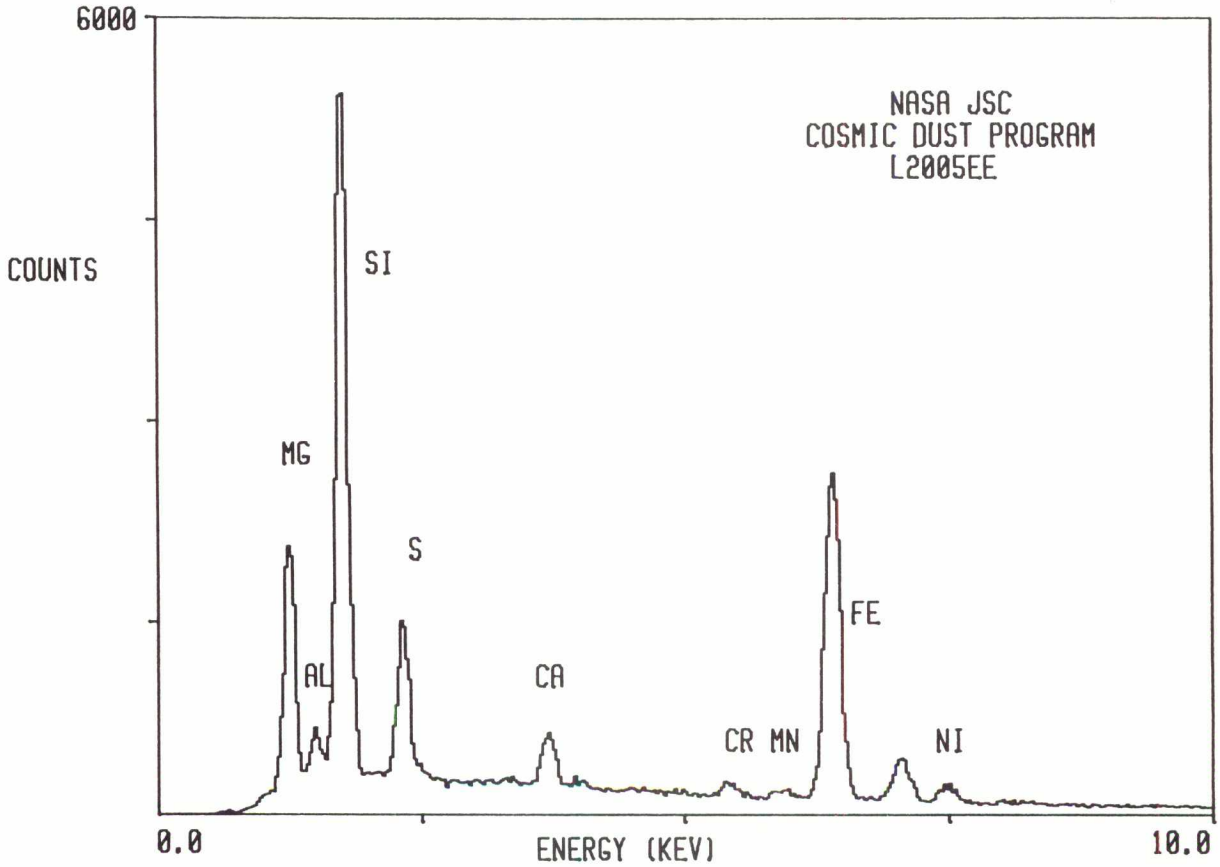
L2005 AE 14



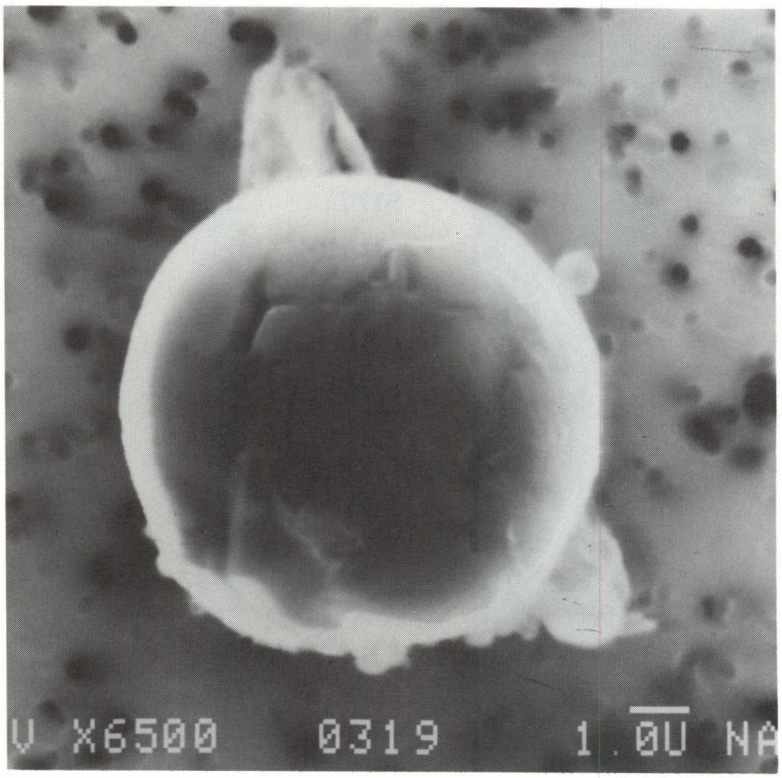
S-92-35898

SIZE: 18x12
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



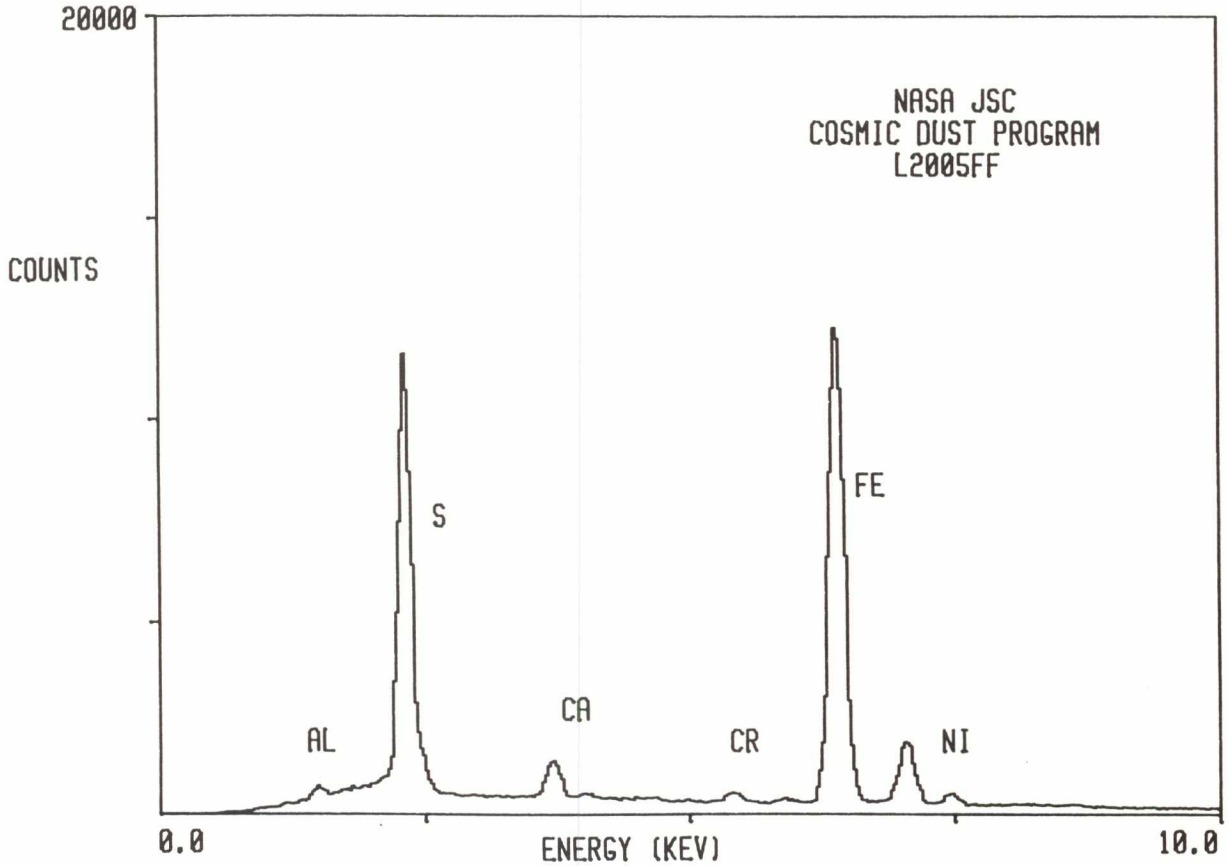
L2005 AF 3



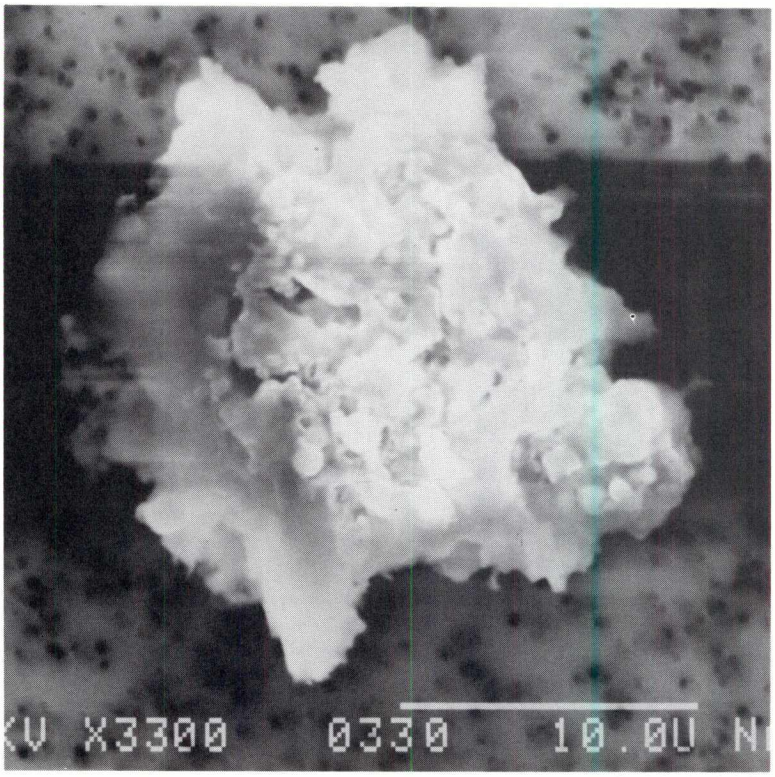
S-92-35382

SIZE: 8
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



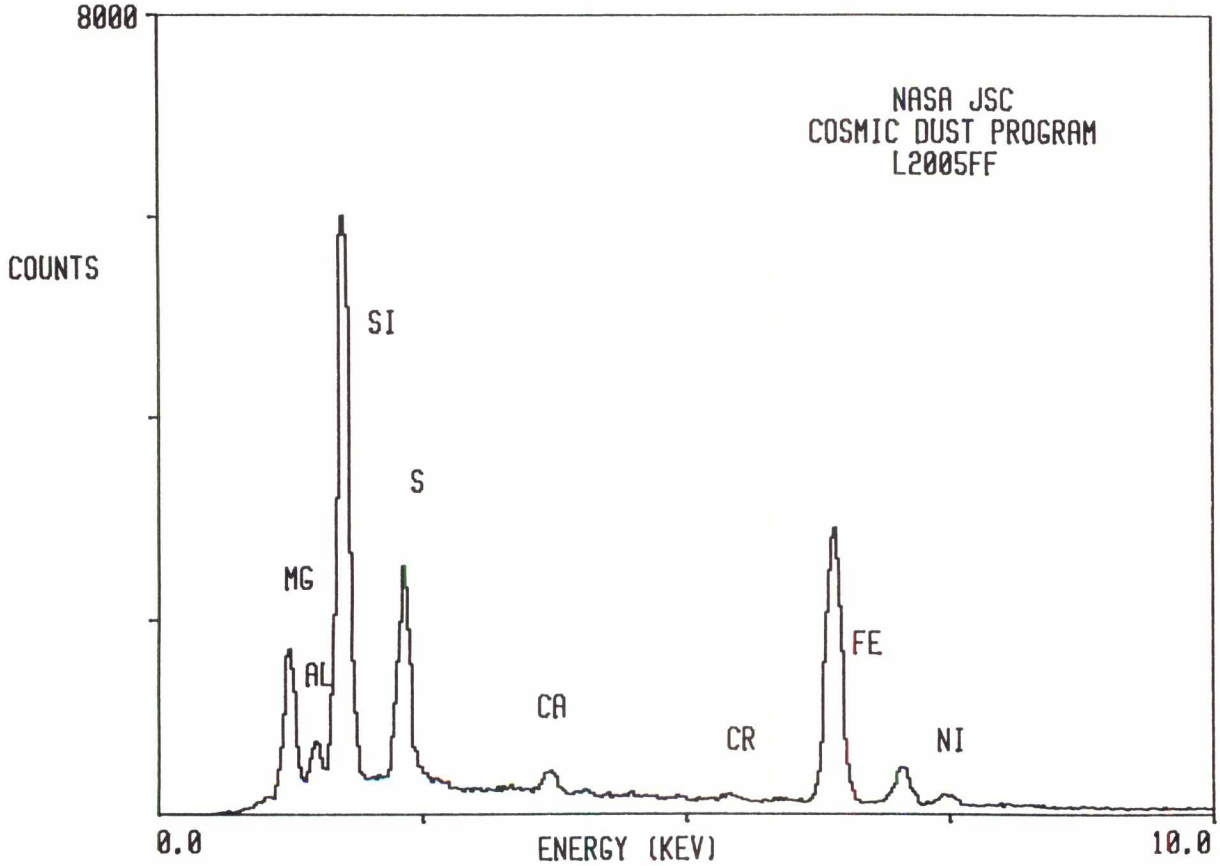
L2005 AF 5



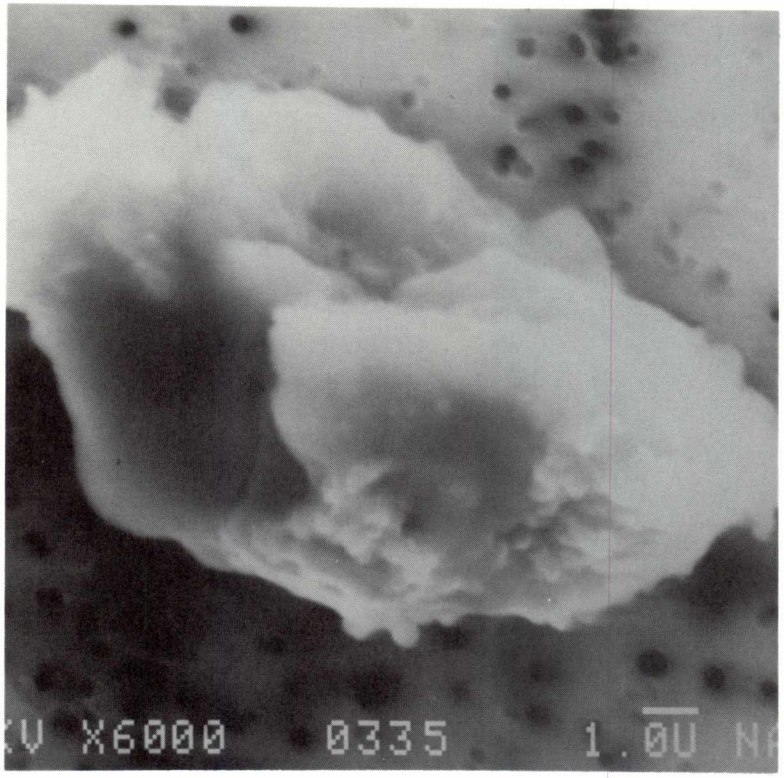
S-92-35384

SIZE: 22x17
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



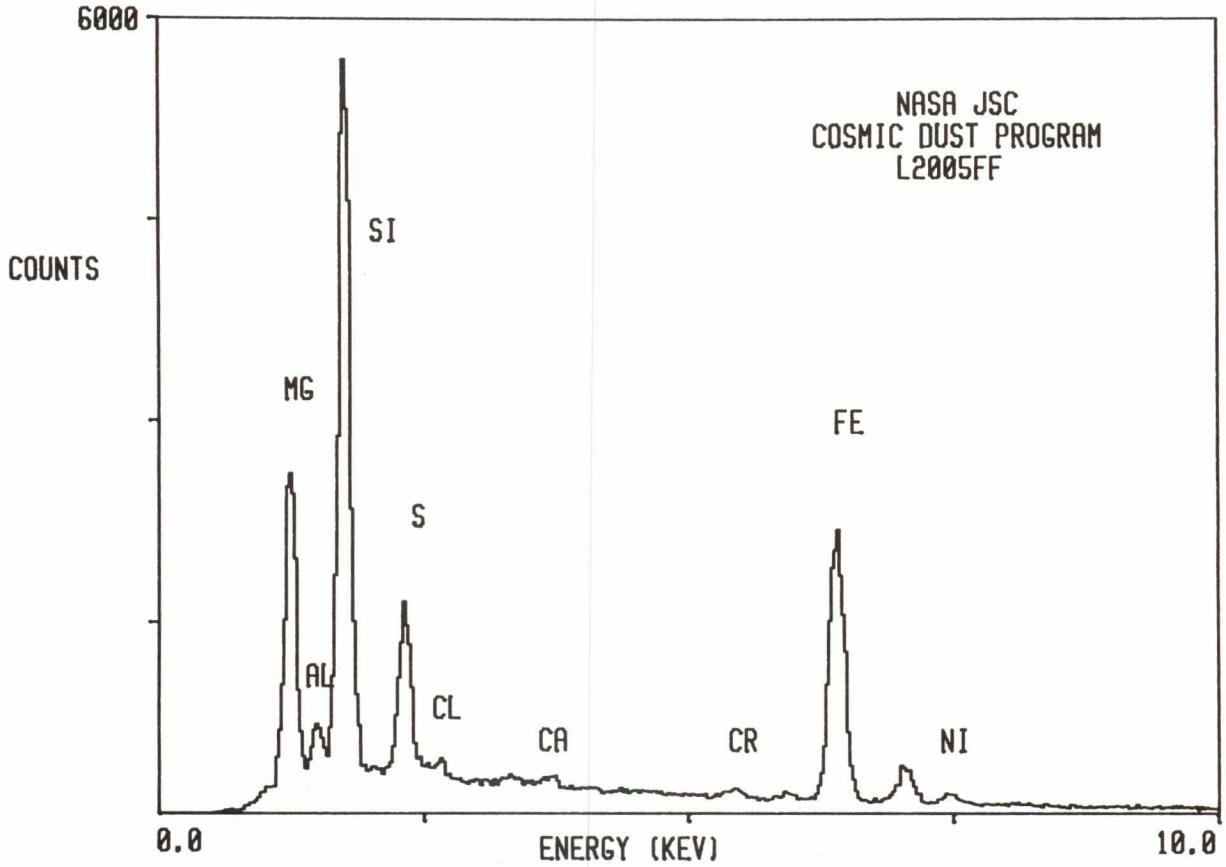
L2005 AF 7



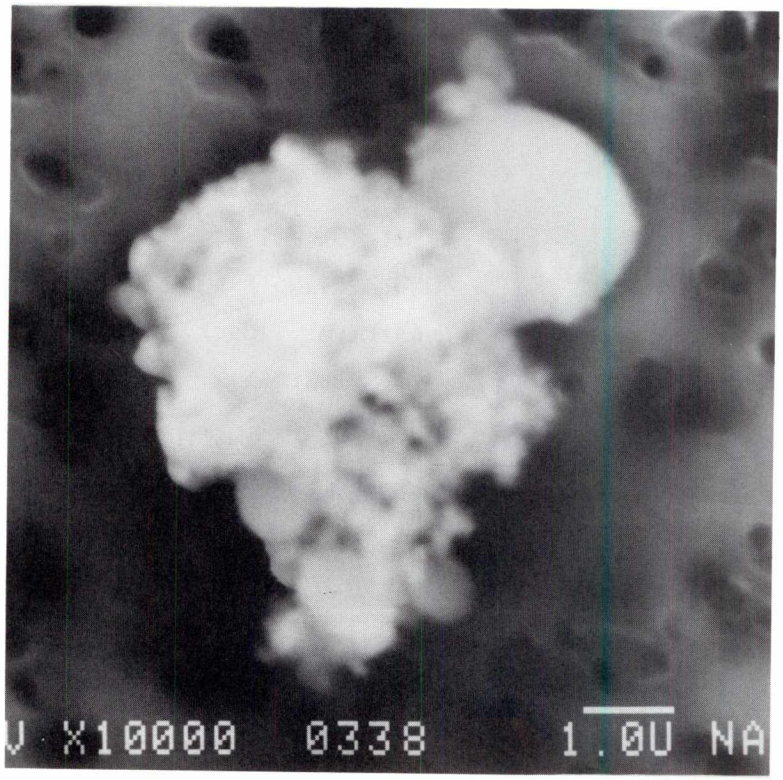
S-92-35386

SIZE: 16x10
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



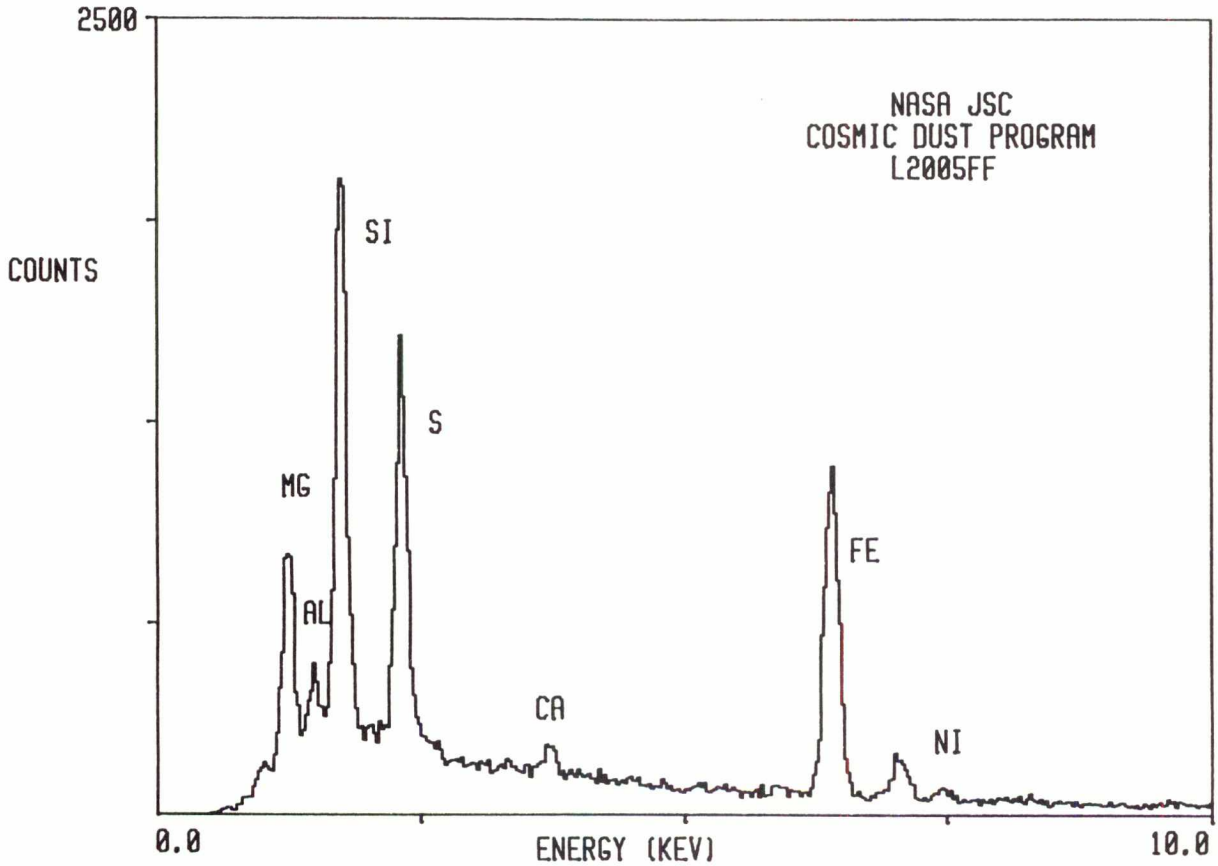
L2005 AF 9



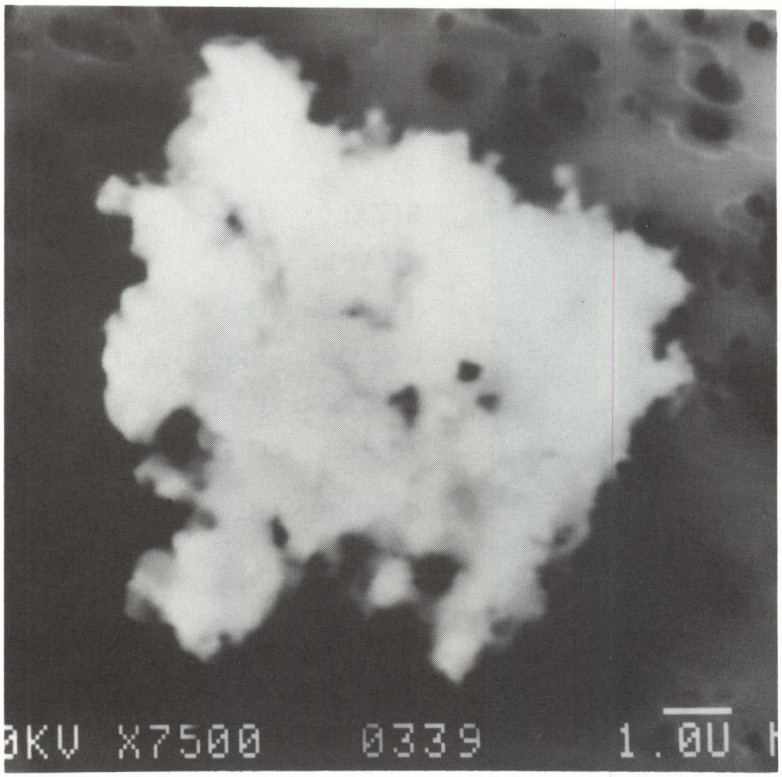
S-92-35388

SIZE: 4
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



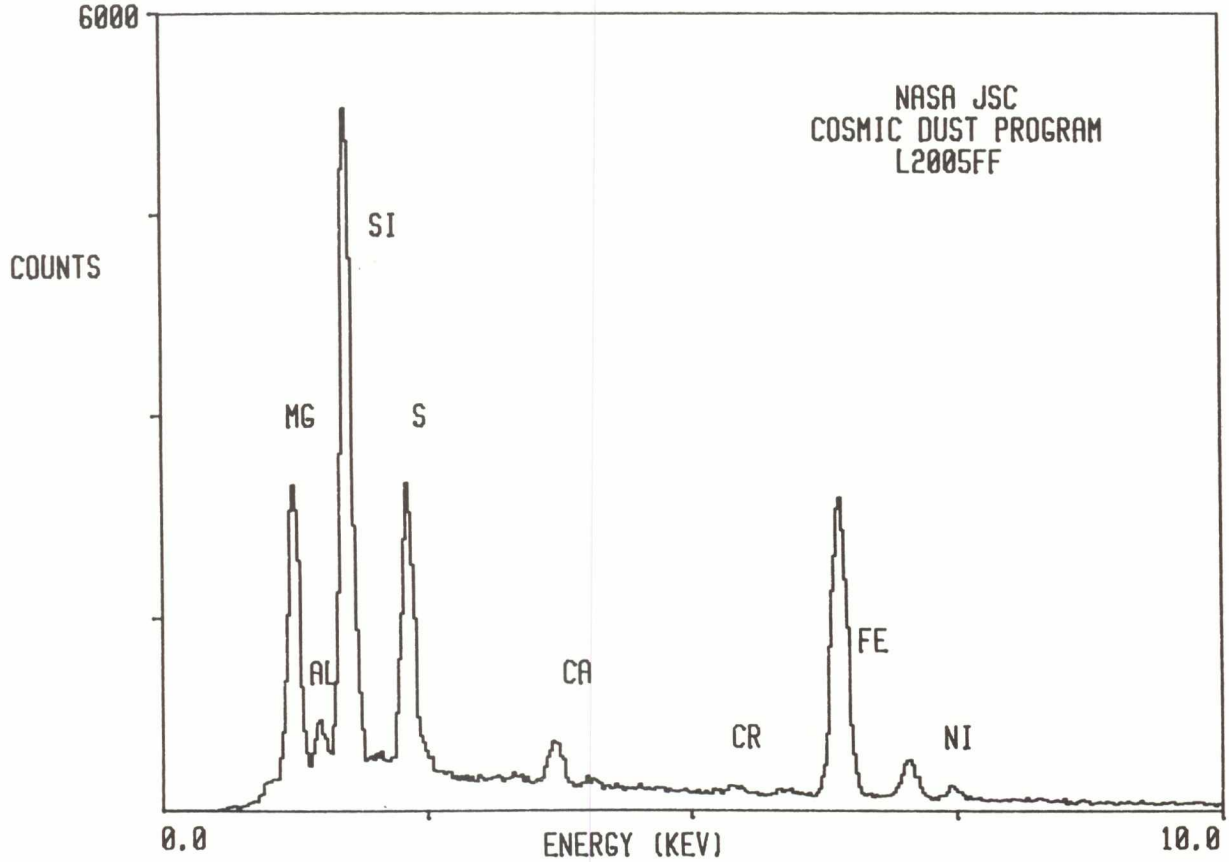
L2005 AF 10



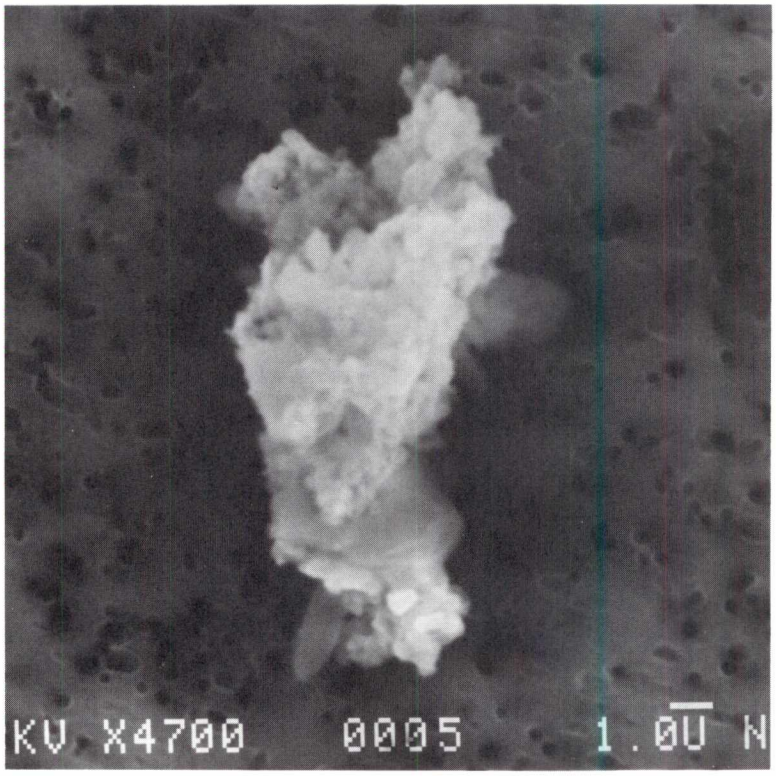
S-92-35389

SIZE: 9x8
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



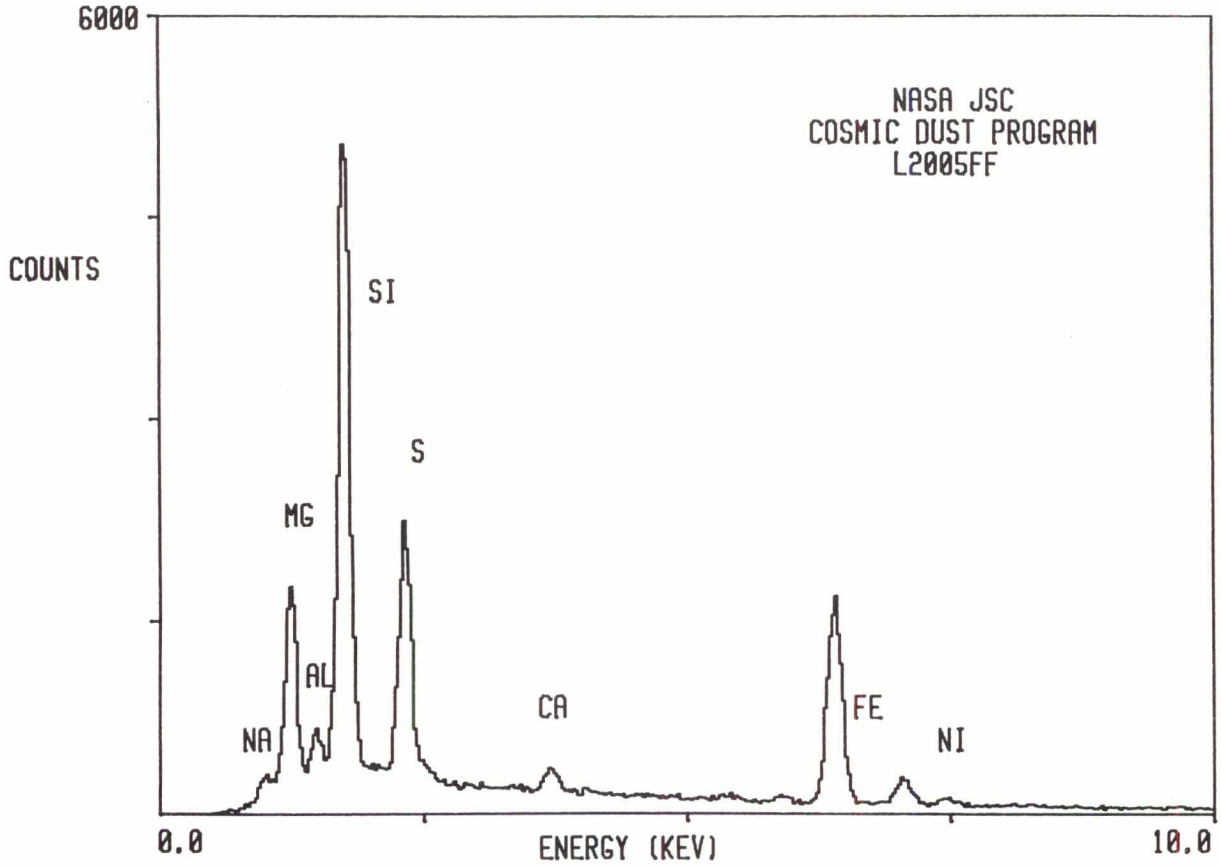
L2005 AF 11



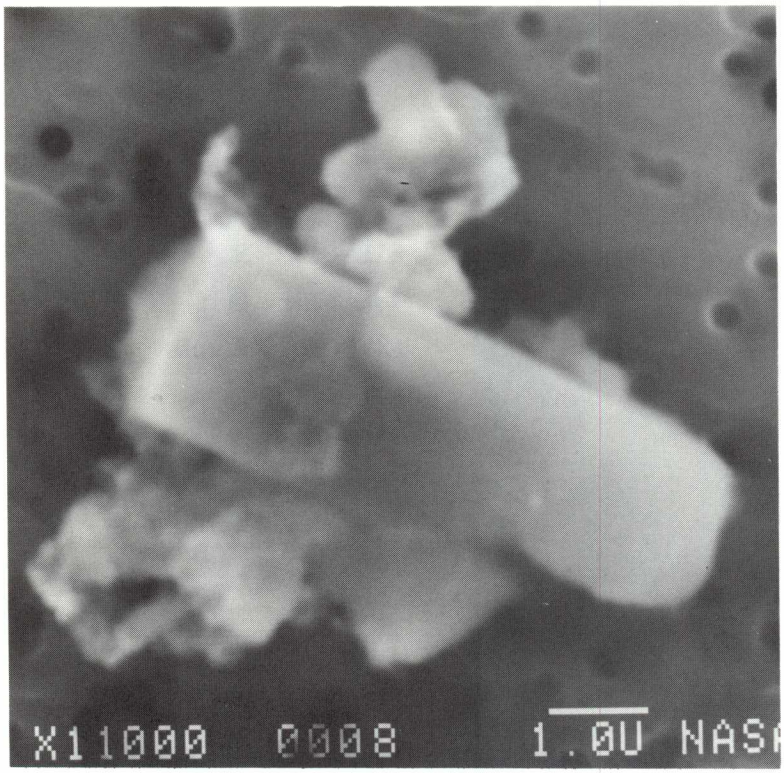
S-92-35390

SIZE: 12x8
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



L2005 AF 12



S-92-35391

SIZE: 8x6

SHAPE: I

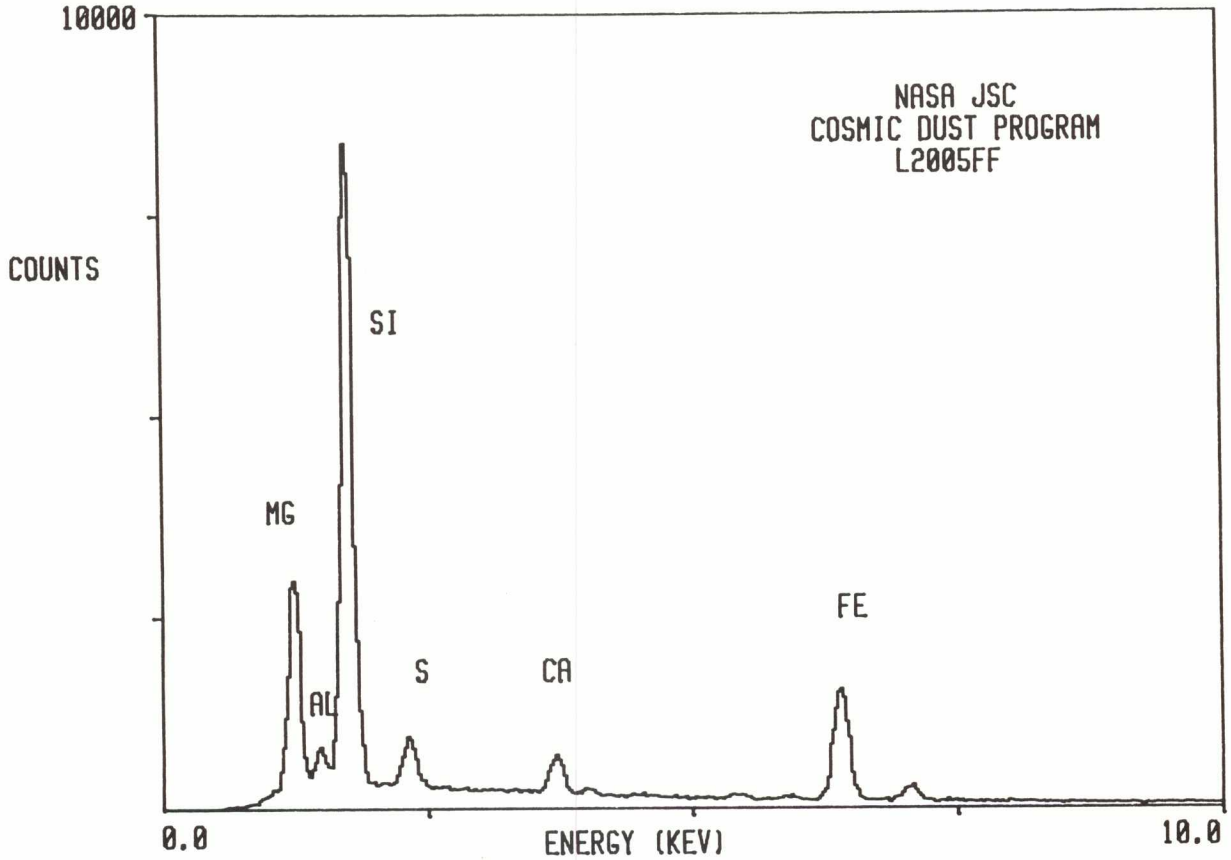
TRANS.: O

COLOR: Colorless to Black

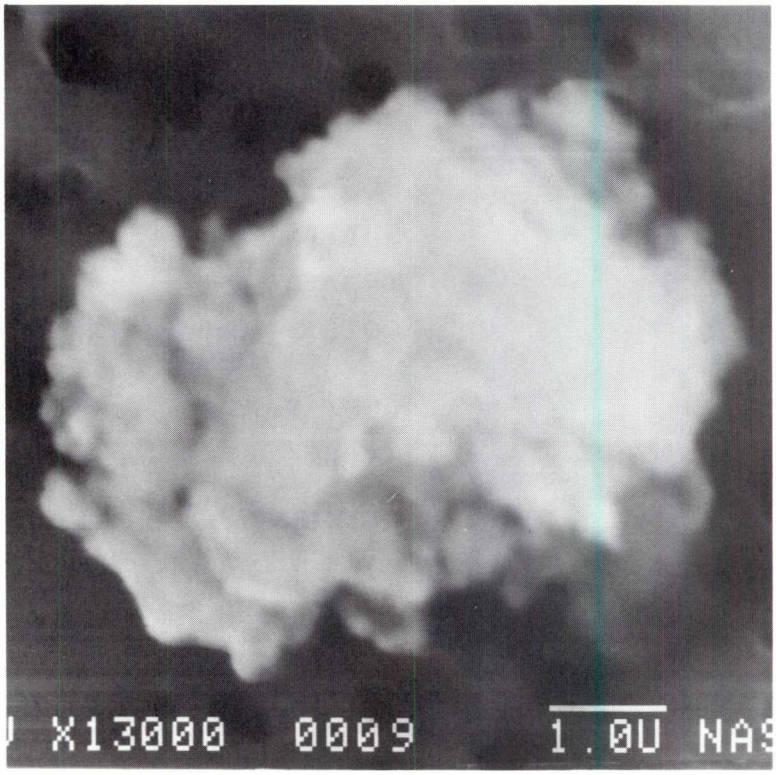
LUSTER: D

TYPE: C

COMMENTS:



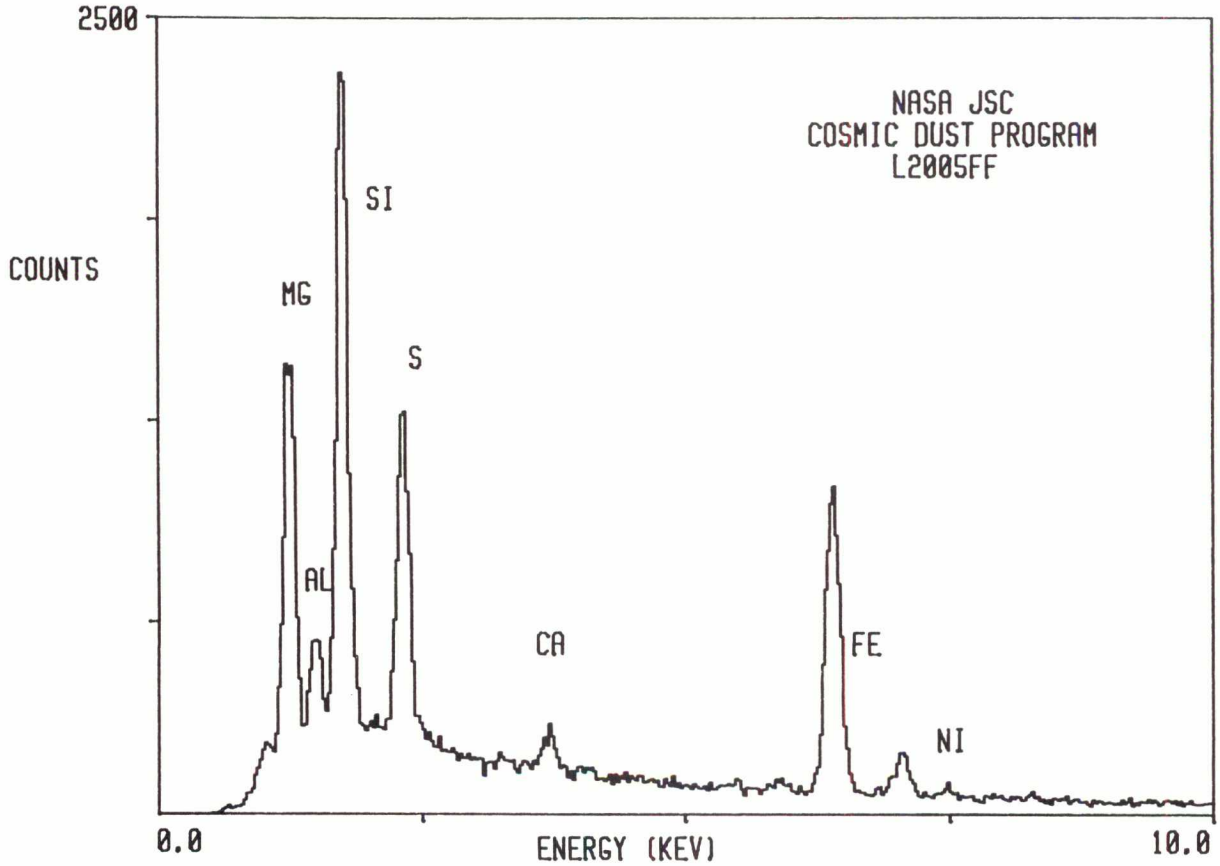
L2005 AF 13



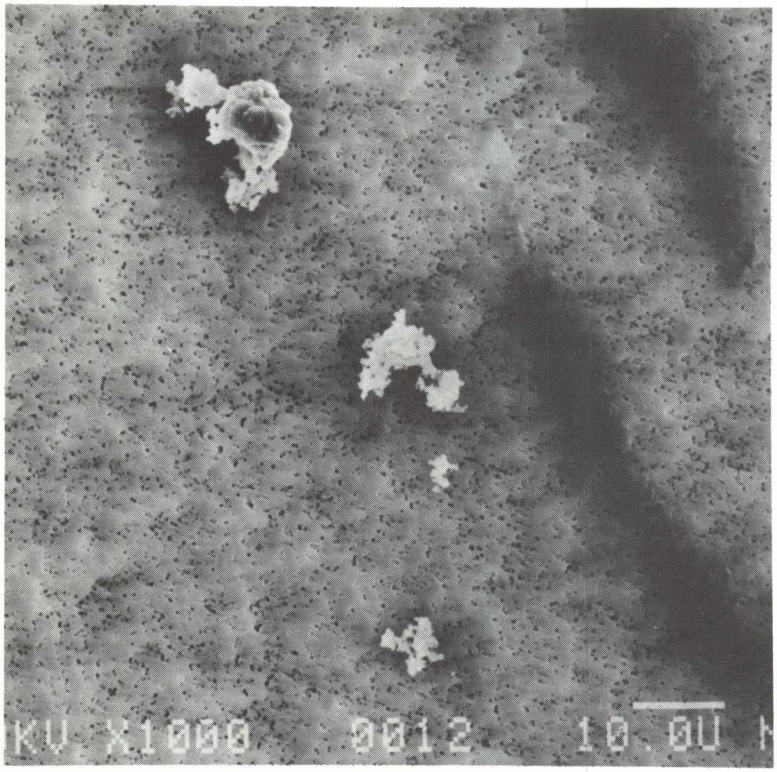
S-92-35392

SIZE: 5
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



L2005 AF 14



S-92-35393

SIZE: 10

SHAPE: E

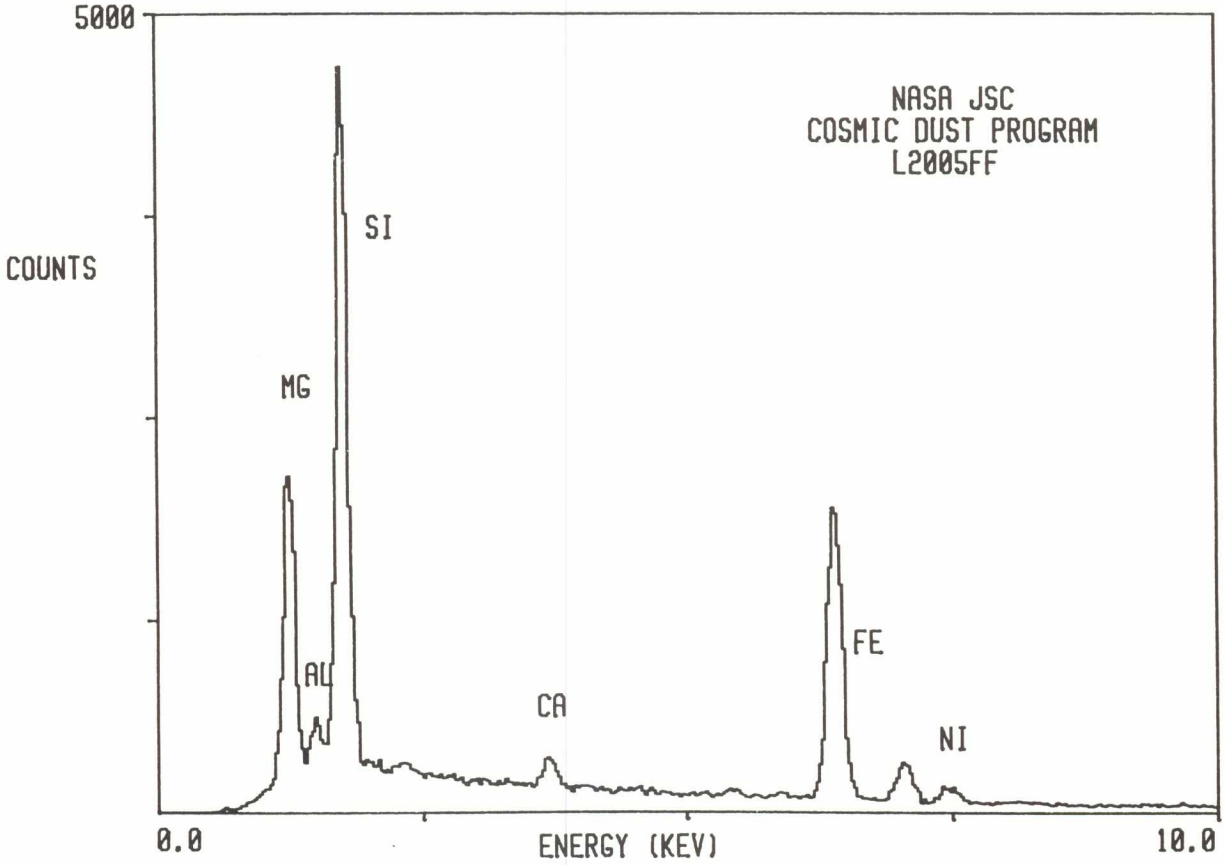
TRANS.: TL

COLOR: Brown

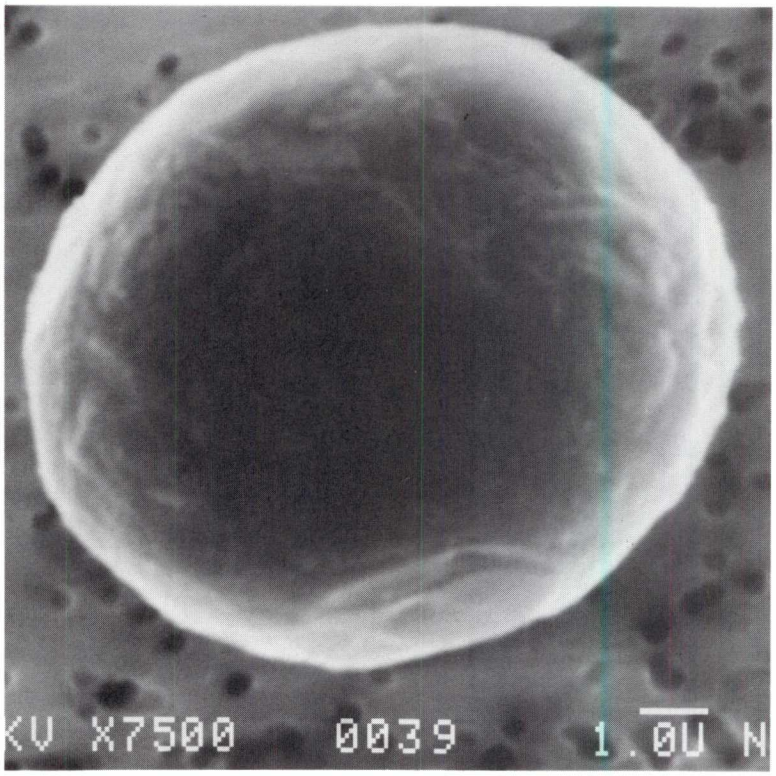
LUSTER: R

TYPE: C

COMMENTS:
Largest grain is 10 microns



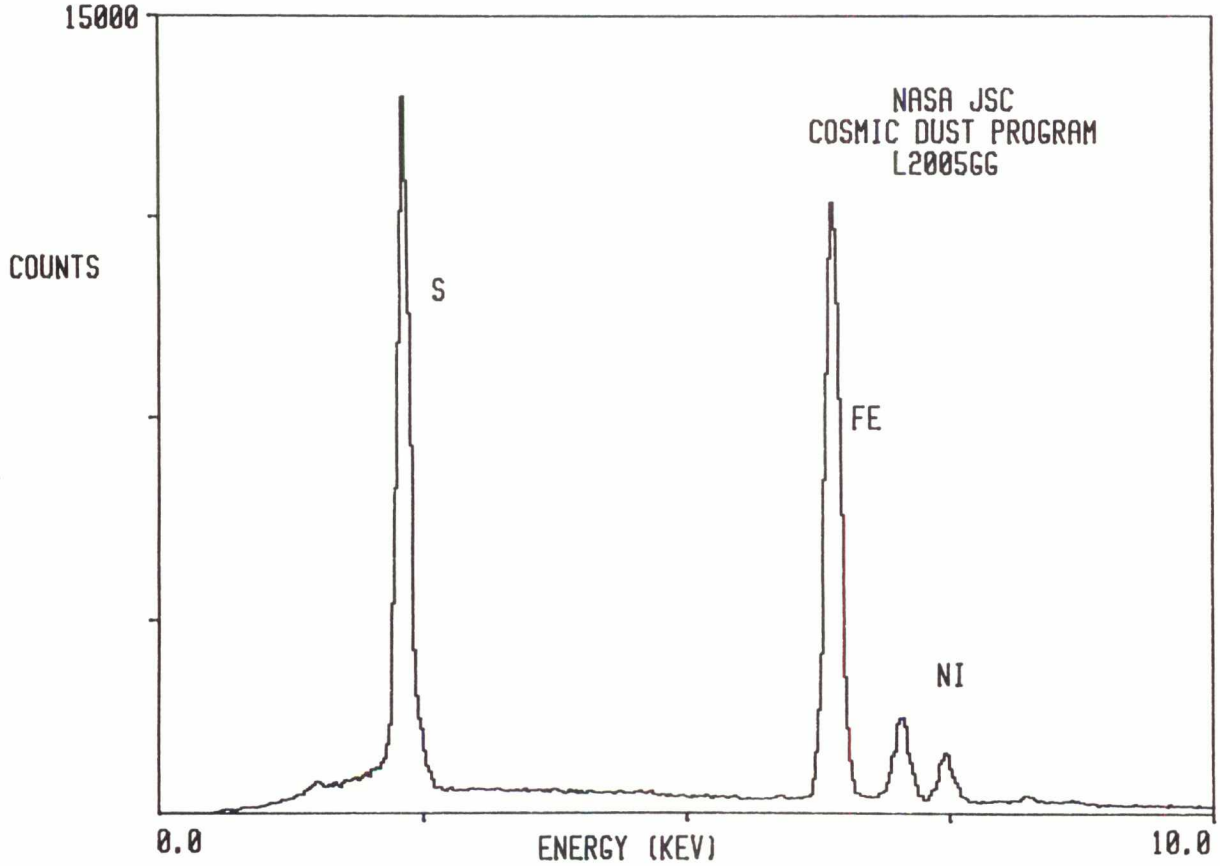
L2005 AG 2



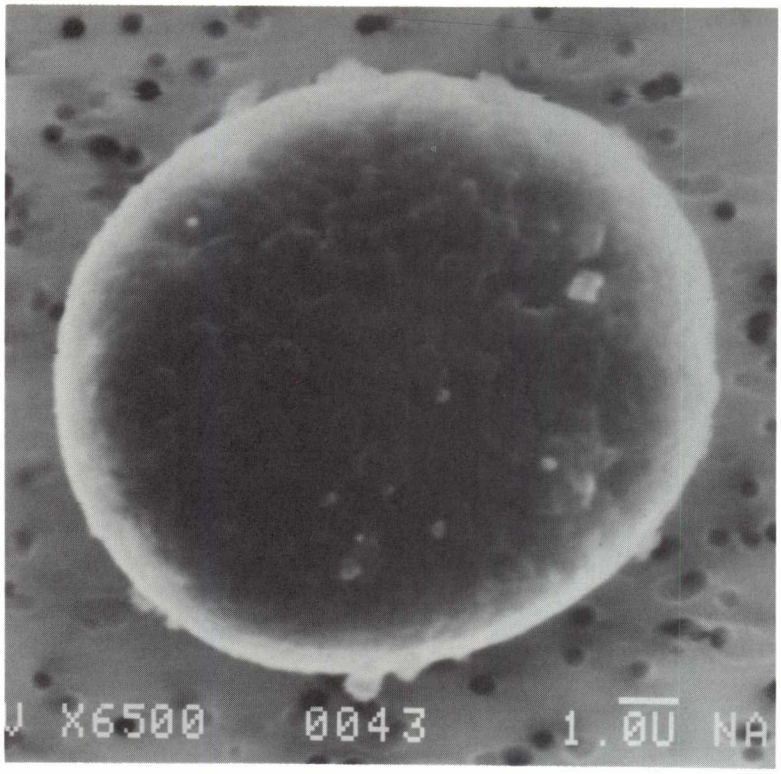
S-92-35364

SIZE: 9
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



L2005 AG 4



S-92-35366

SIZE: 10

SHAPE: S

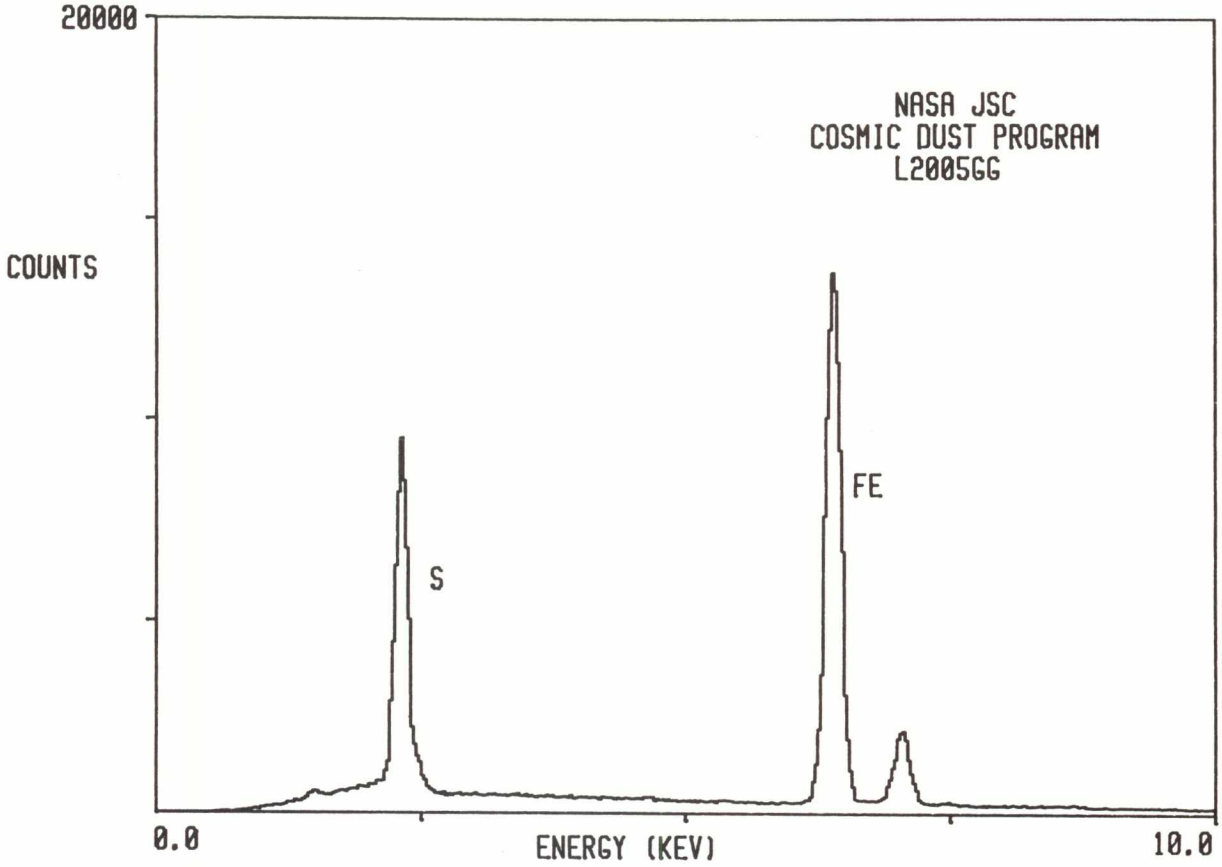
TRANS.: O

COLOR: Yellow

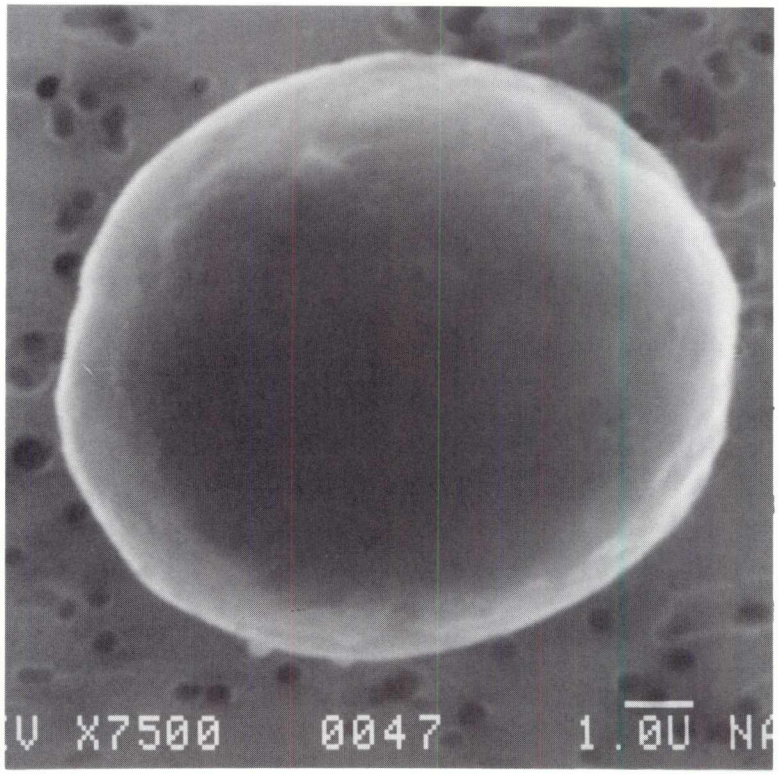
LUSTER: M

TYPE: C

COMMENTS:



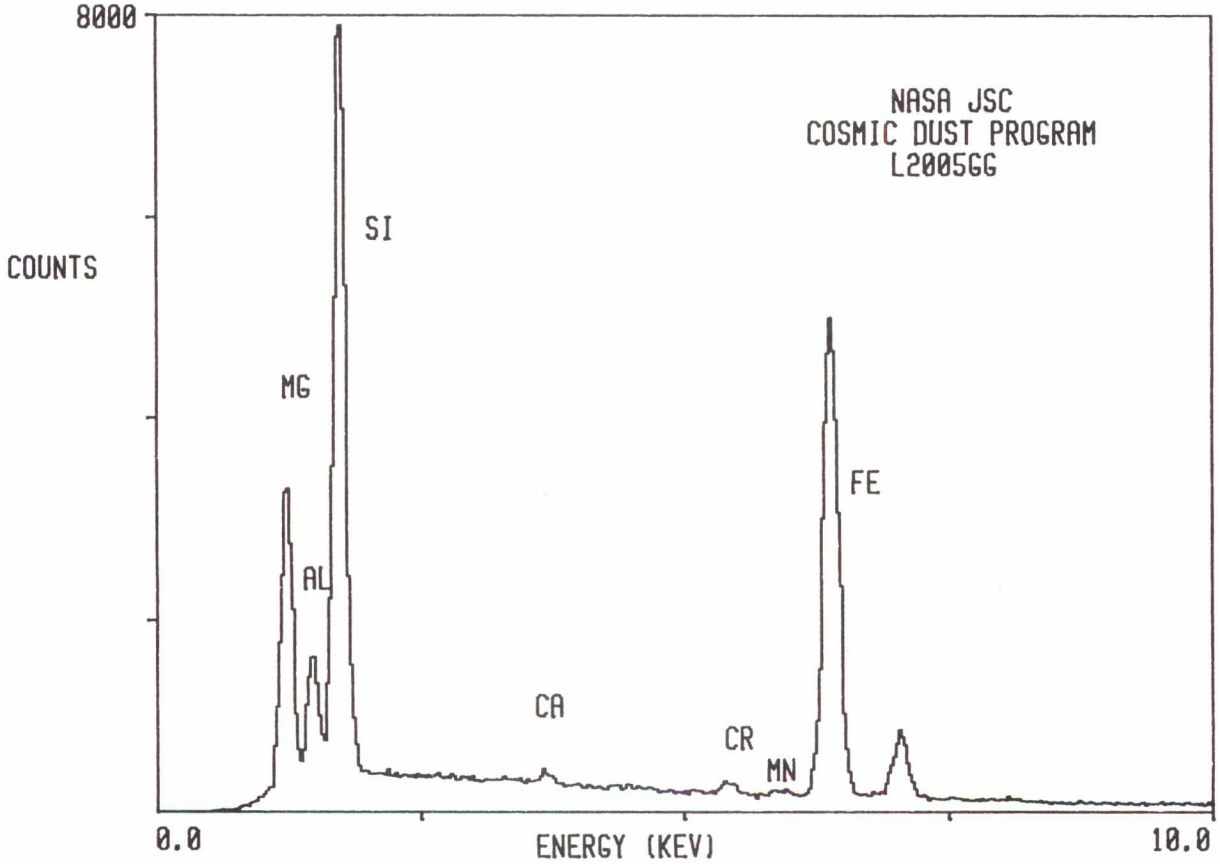
L2005 AG 6



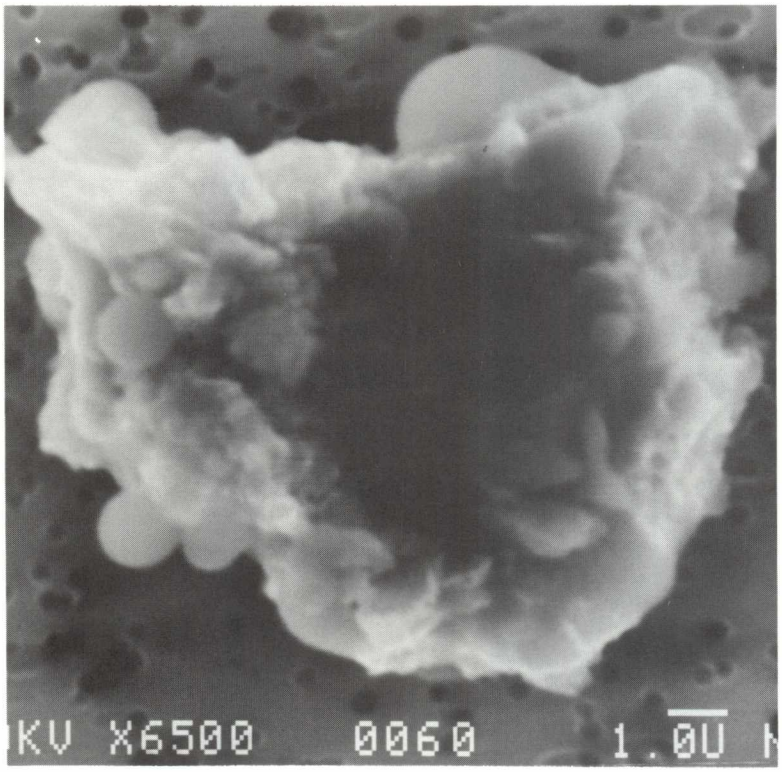
S-92-35368

SIZE: 9
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



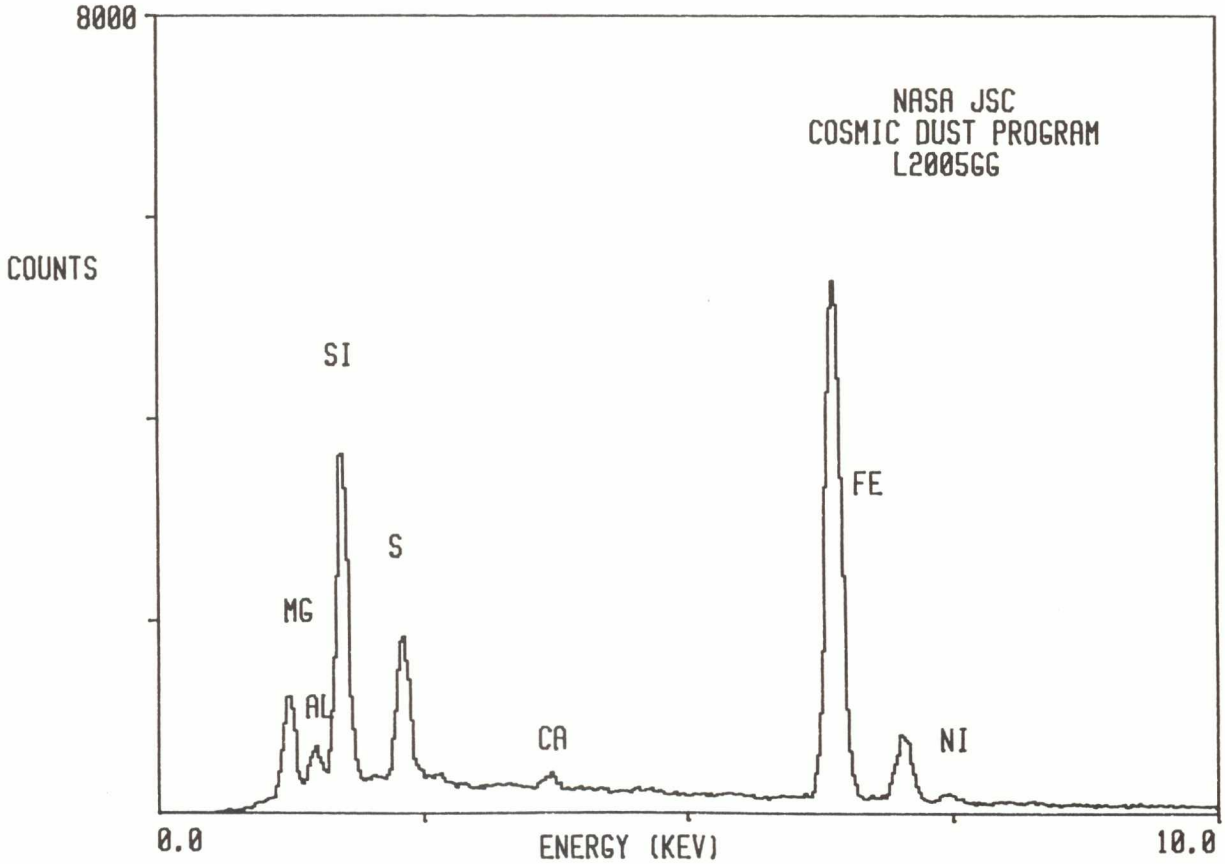
L2005 AG 11



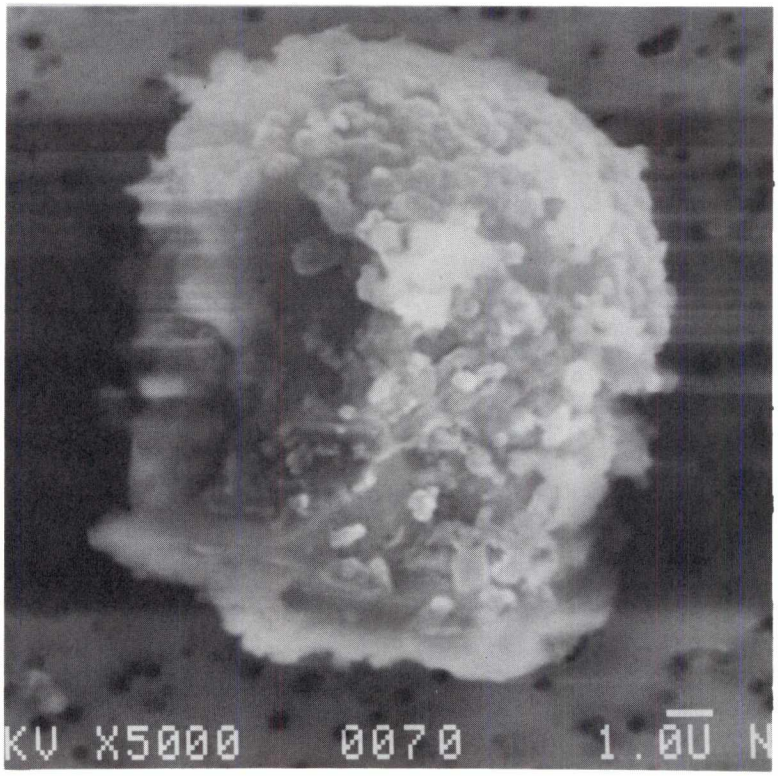
S-92-35373

SIZE: 12x10
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



L2005 AG 13



S-92-35375

SIZE: 12x10

SHAPE: E

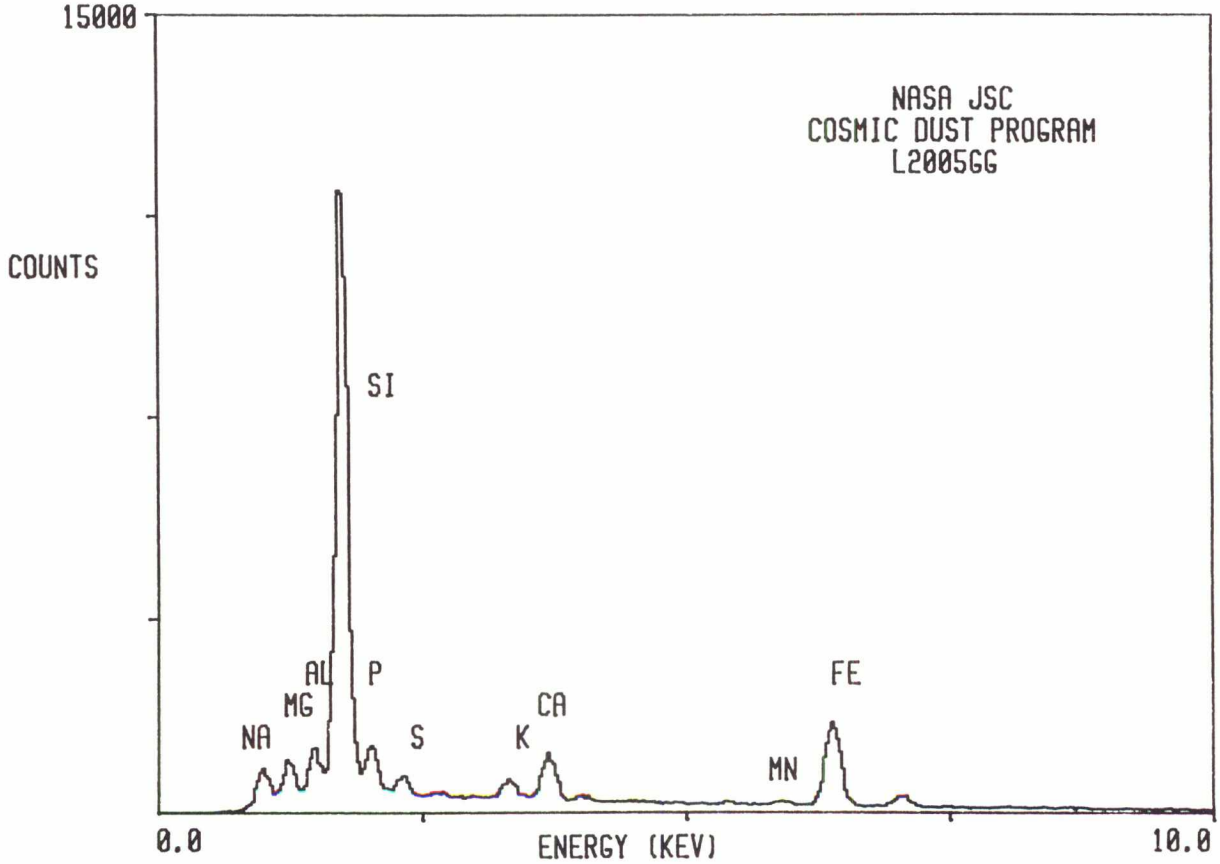
TRANS.: TL

COLOR: Colorless

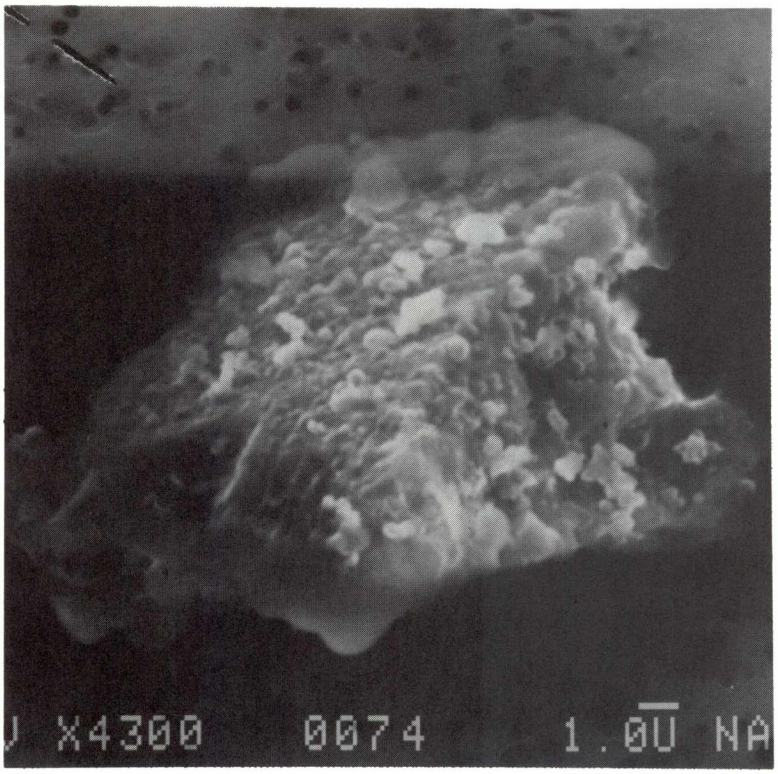
LUSTER: V

TYPE: C?

COMMENTS:



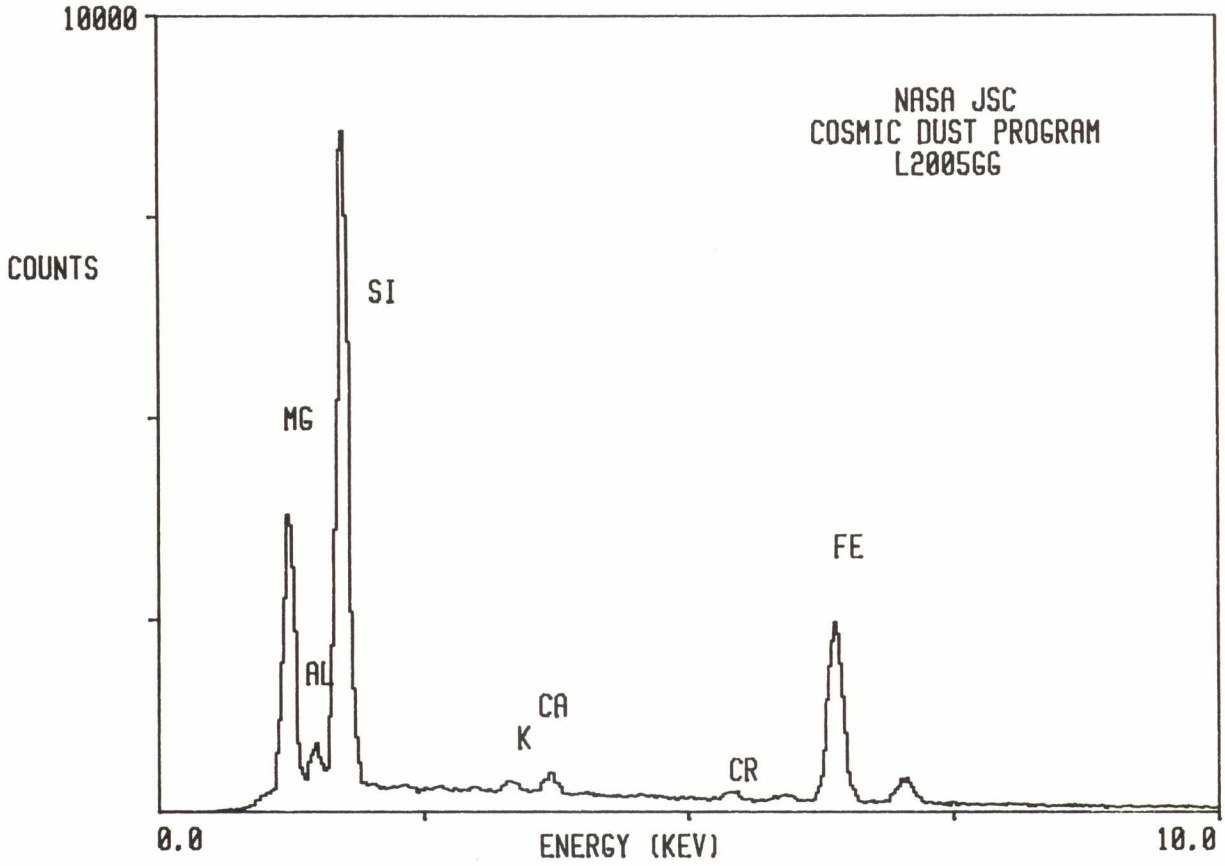
L2005 AG 14



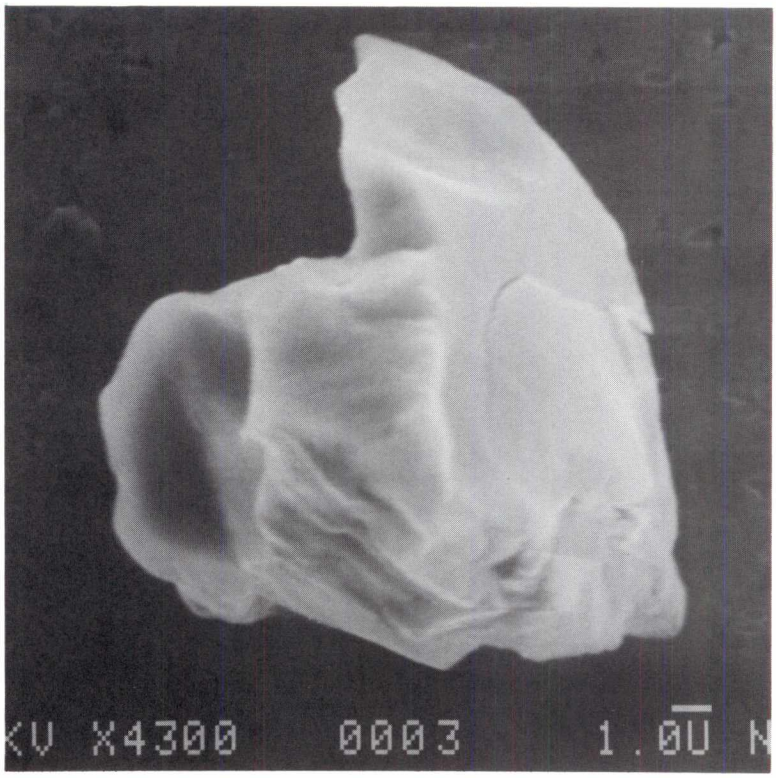
S-92-35376

SIZE: 17x12
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



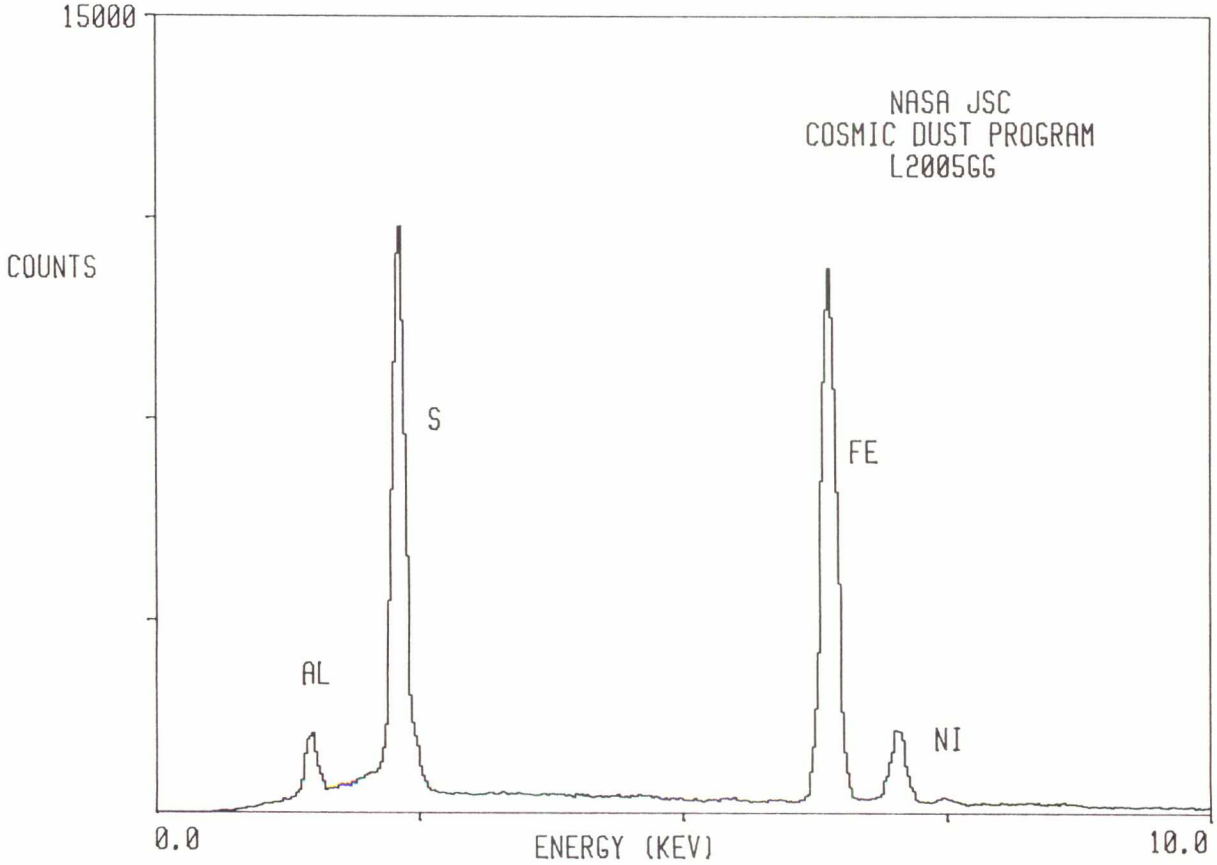
L2005 AG 16



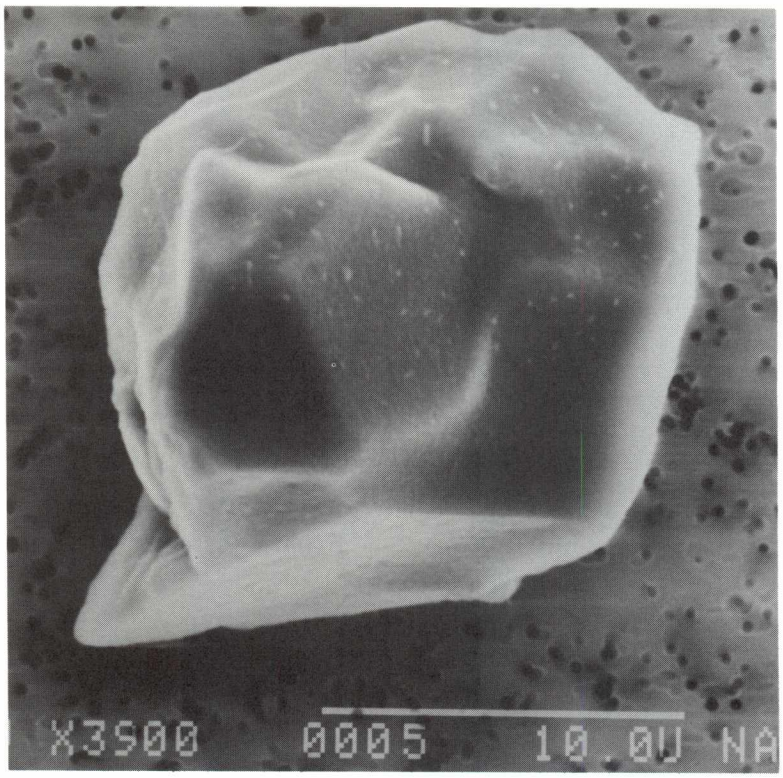
S-92-35378

SIZE: 16
SHAPE: I
TRANS.: O
COLOR: Yellow
LUSTER: M
TYPE: C

COMMENTS:



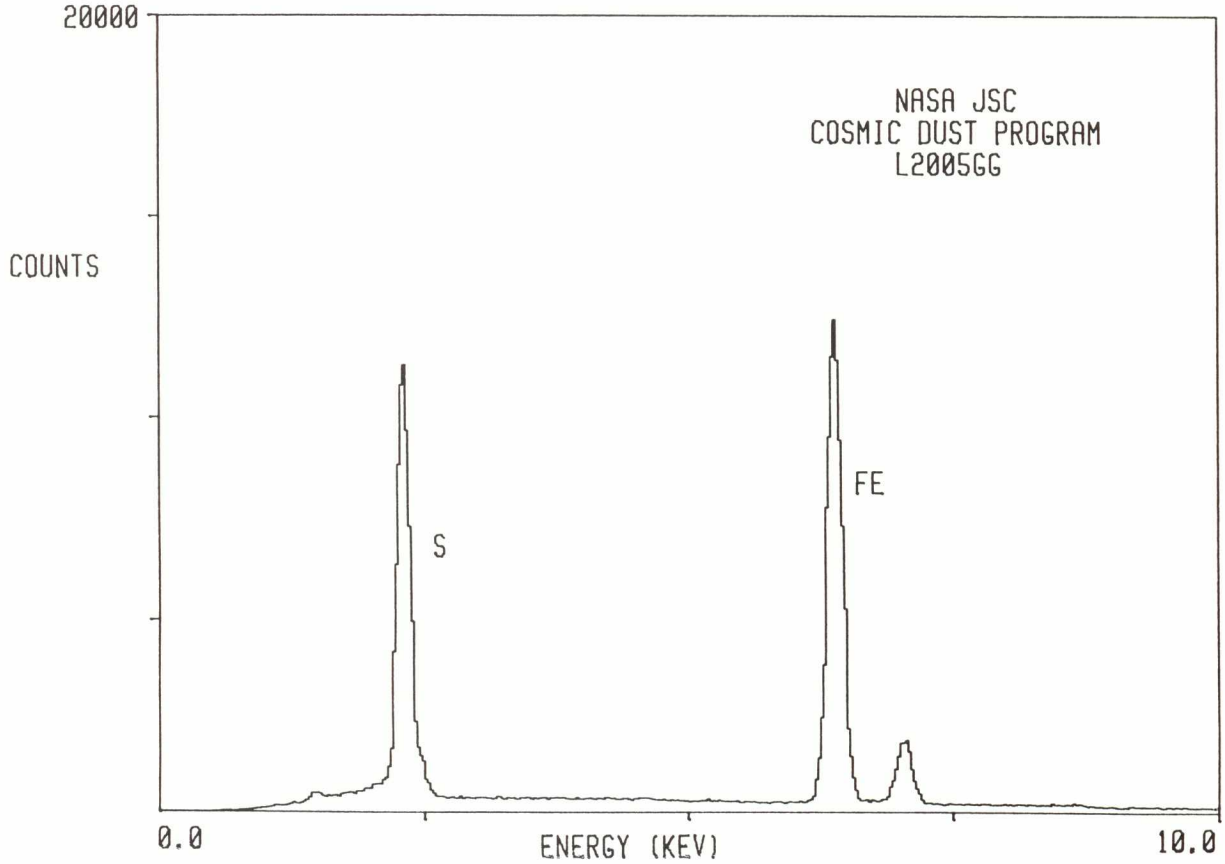
L2005 AG 17



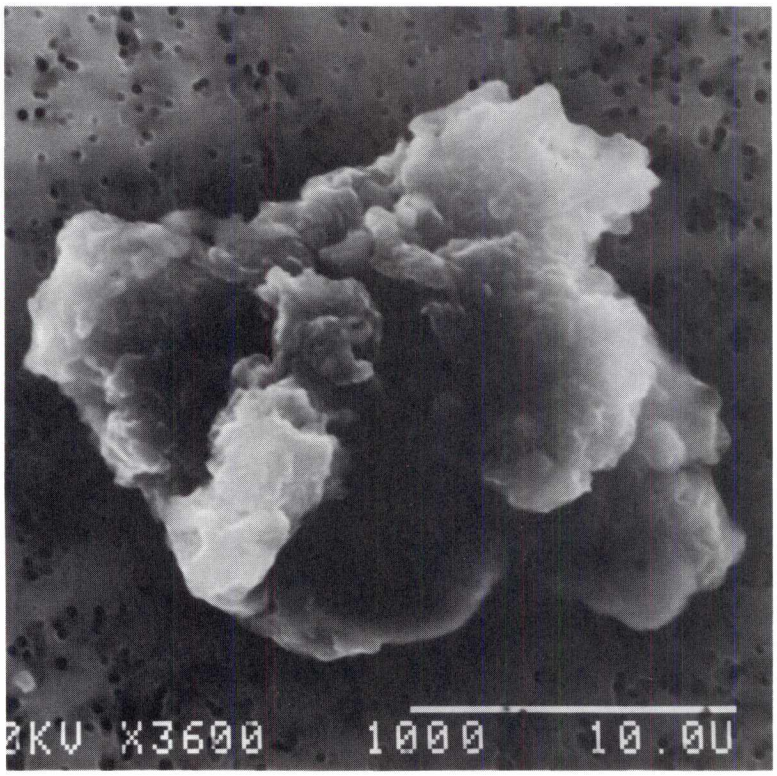
S-92-35379

SIZE: 17
SHAPE: E
TRANS.: O
COLOR: Yellow
LUSTER: M
TYPE: C

COMMENTS:



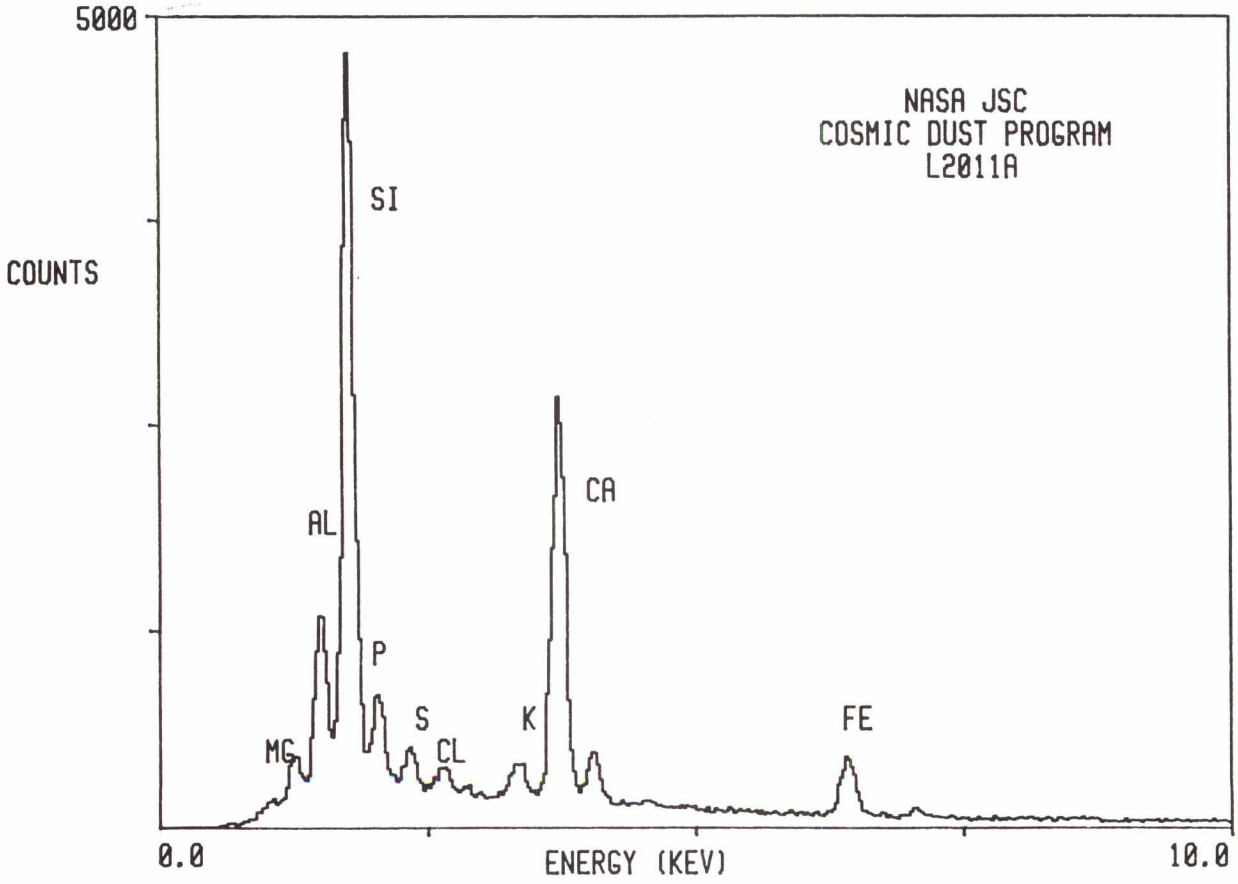
L2011 A 1



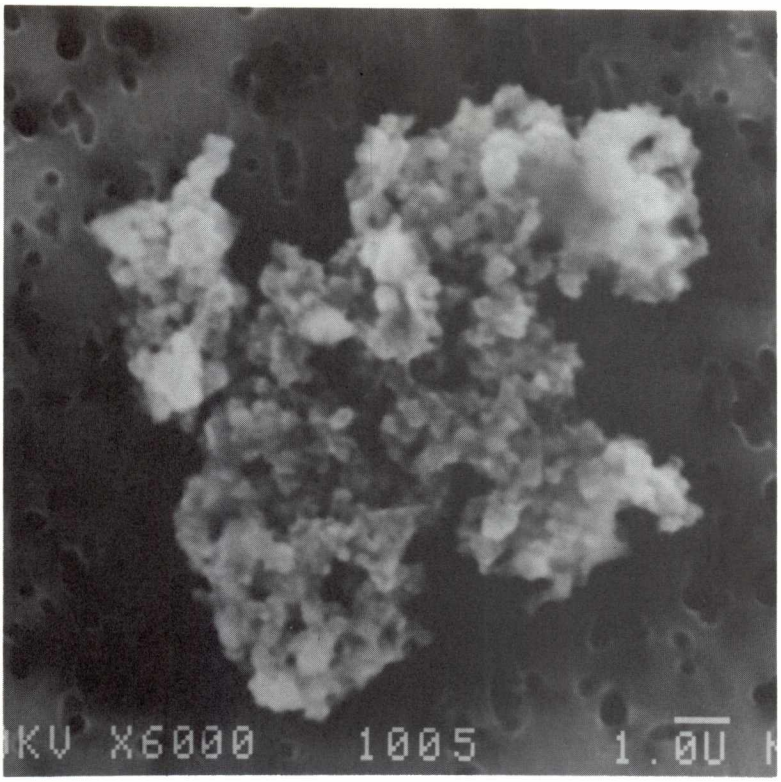
S-92-35882

SIZE: 22x17
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C?

COMMENTS:
From Cluster 1



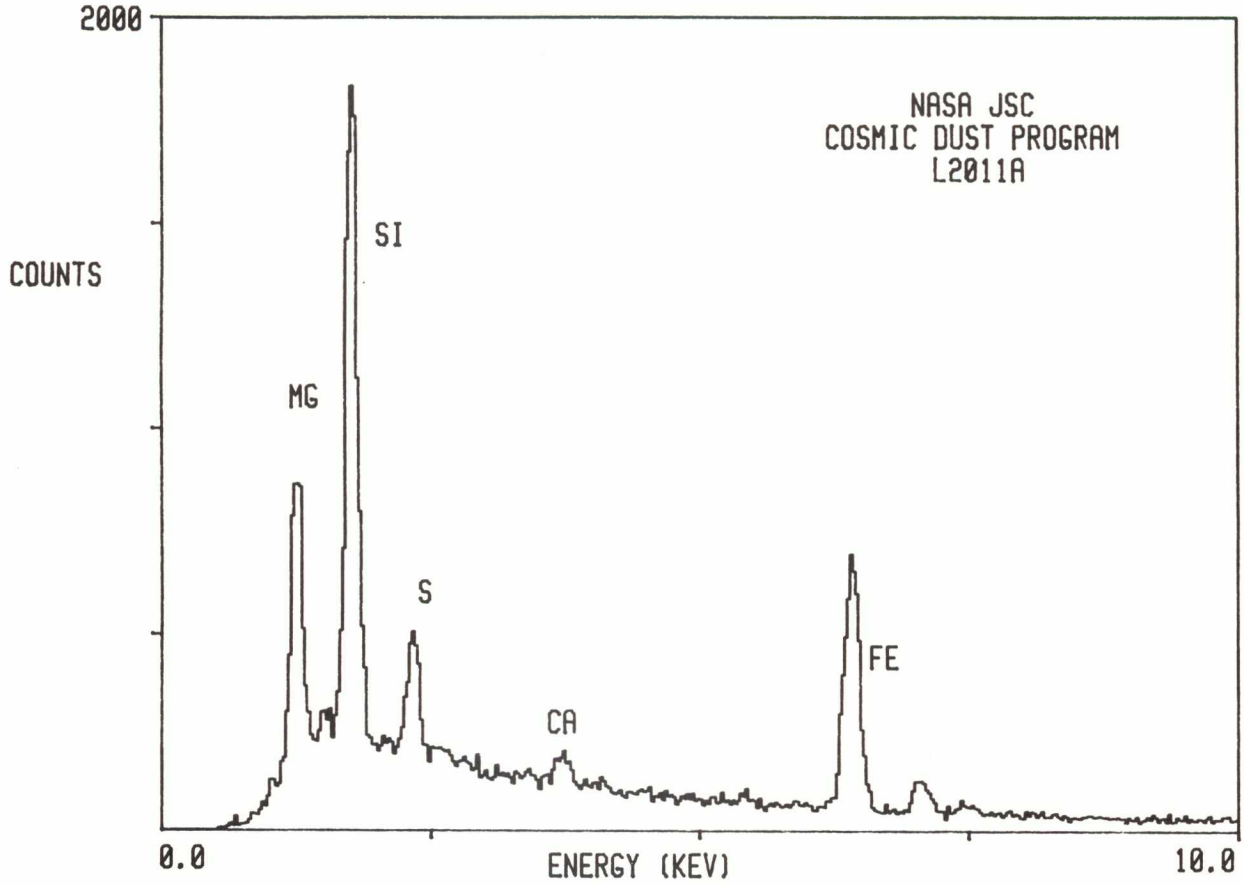
L2011 A 3



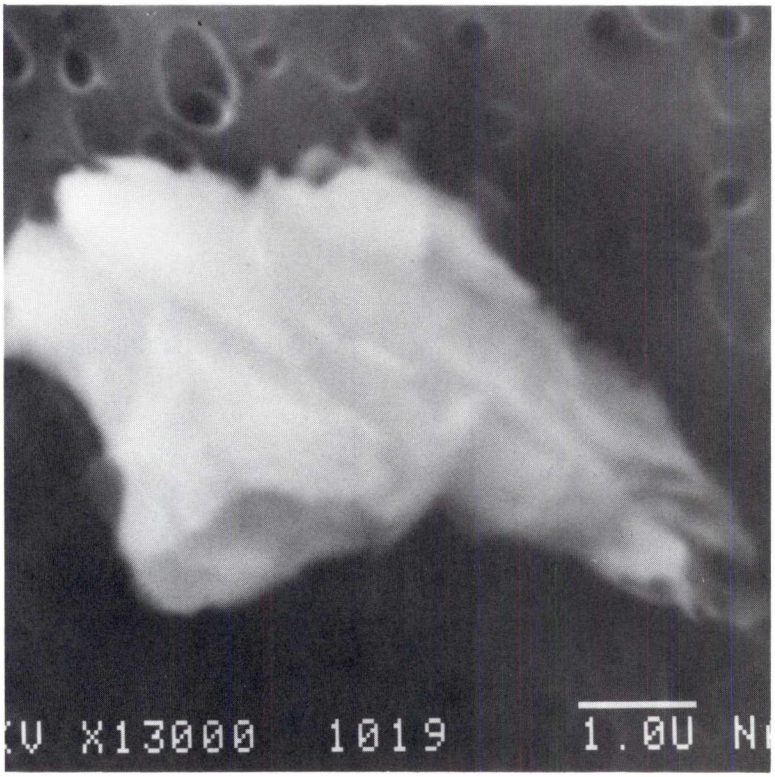
S-92-35884

SIZE: 13x10
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:
From Cluster 3



L2011 C 2



S-92-35873

SIZE: 7

SHAPE: I

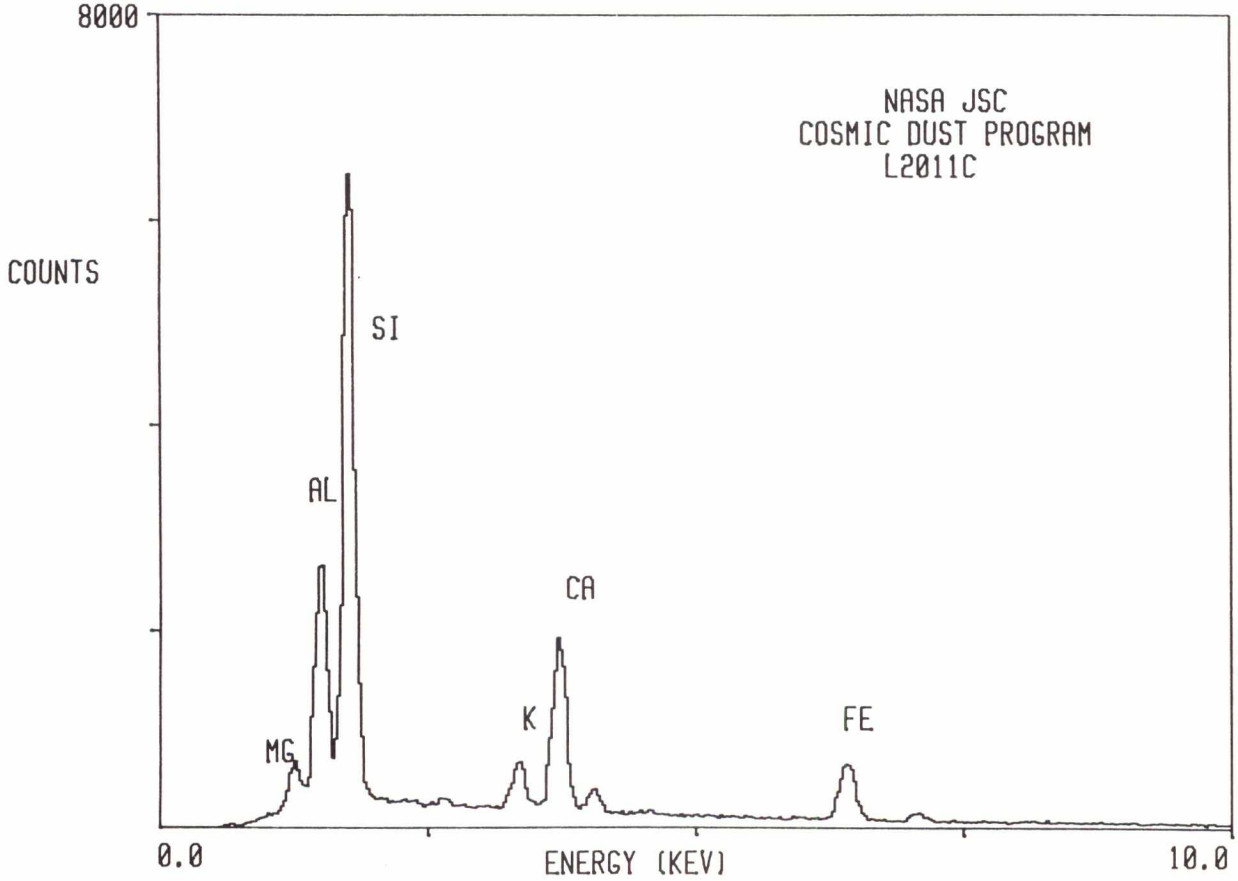
TRANS.: O

COLOR: Brown to White

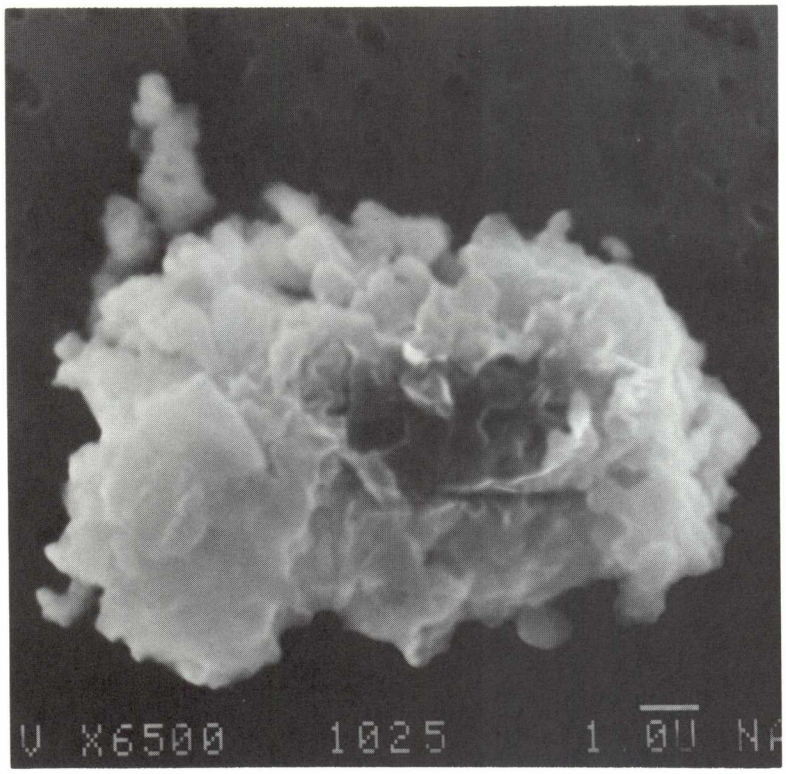
LUSTER: V

TYPE: C?

COMMENTS:
Cluster 9



L2011 C 5



S-92-35876

SIZE: 12x7

SHAPE: I

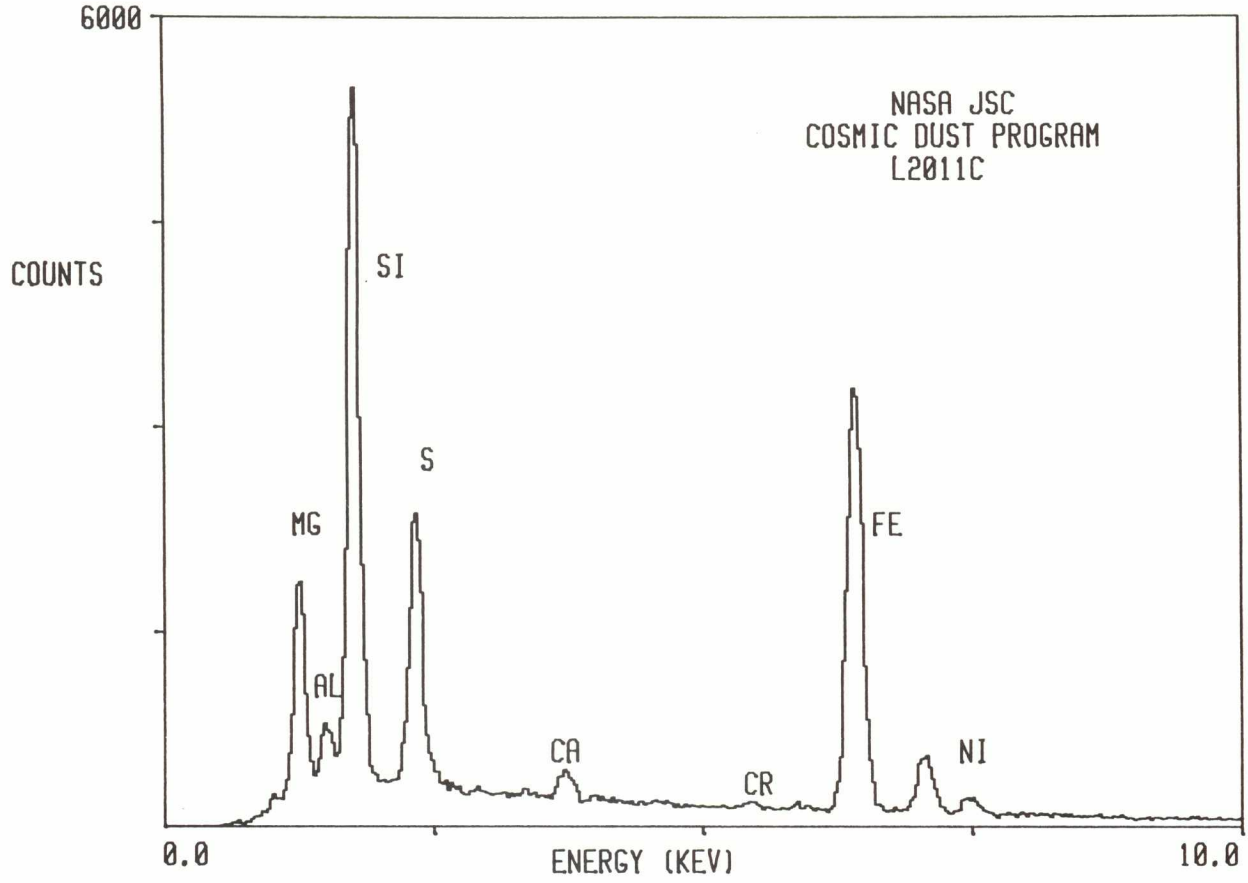
TRANS.: O

COLOR: Black

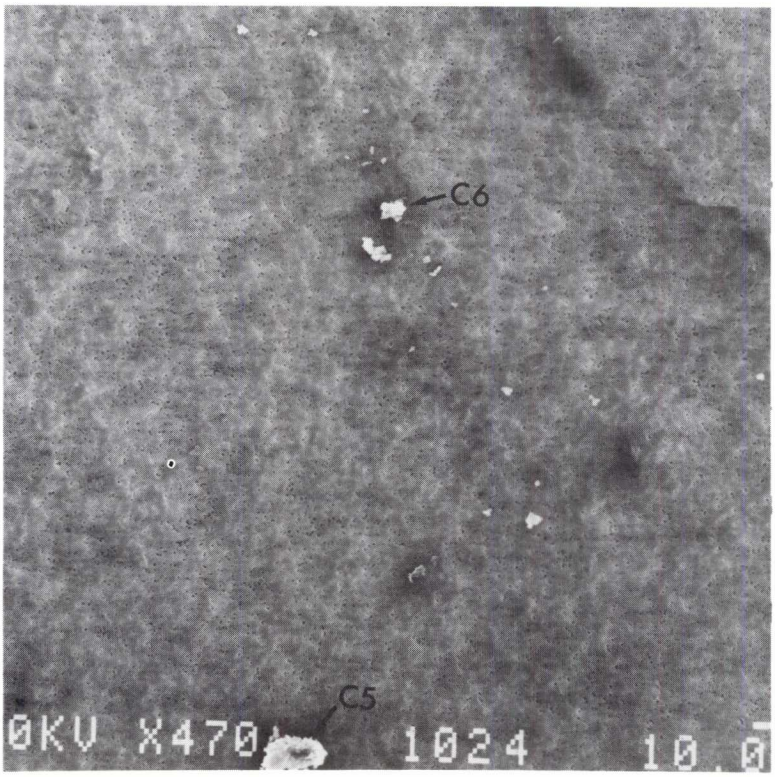
LUSTER: D/SM

TYPE: C

COMMENTS:
Cluster 11



L2011 C 6



S-92-35019

SIZE: 7

SHAPE: I

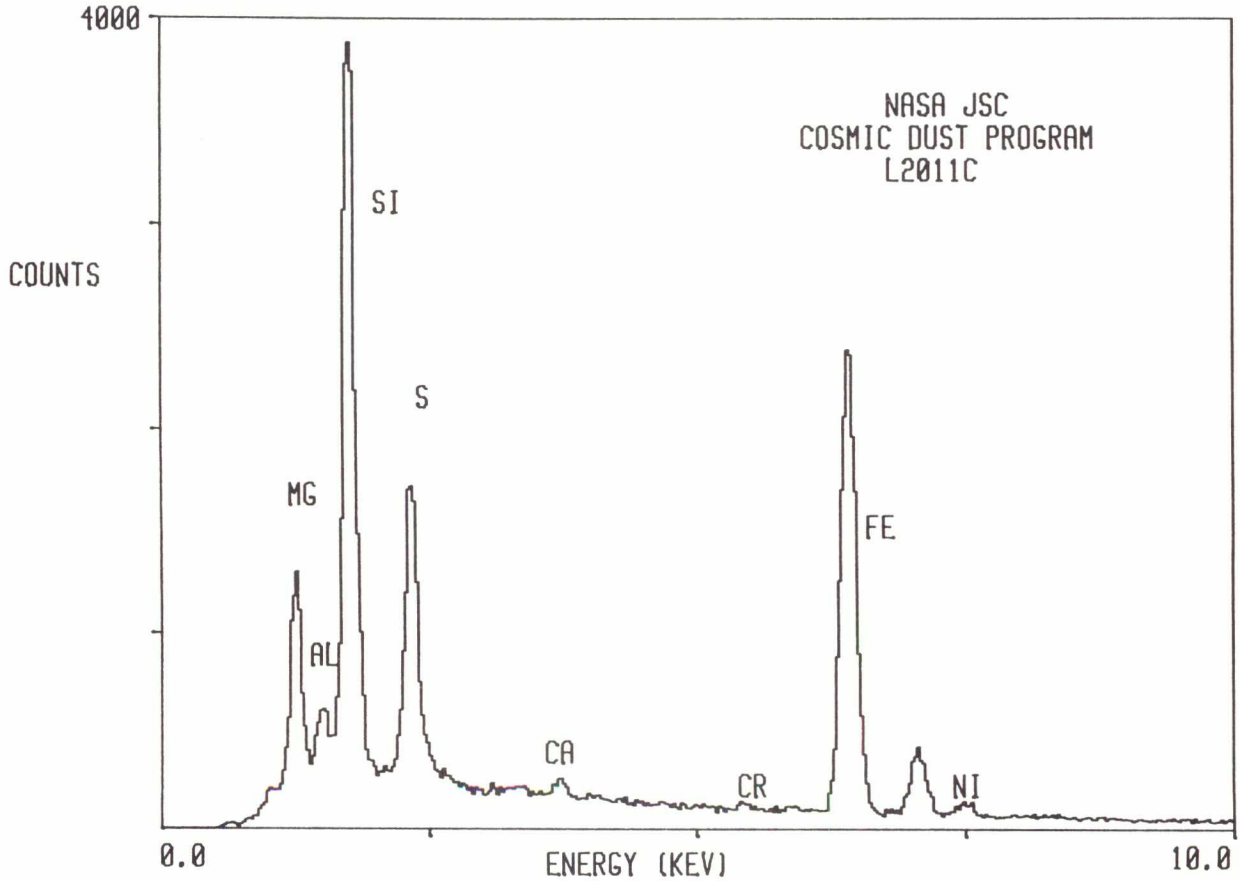
TRANS.: O

COLOR: Black

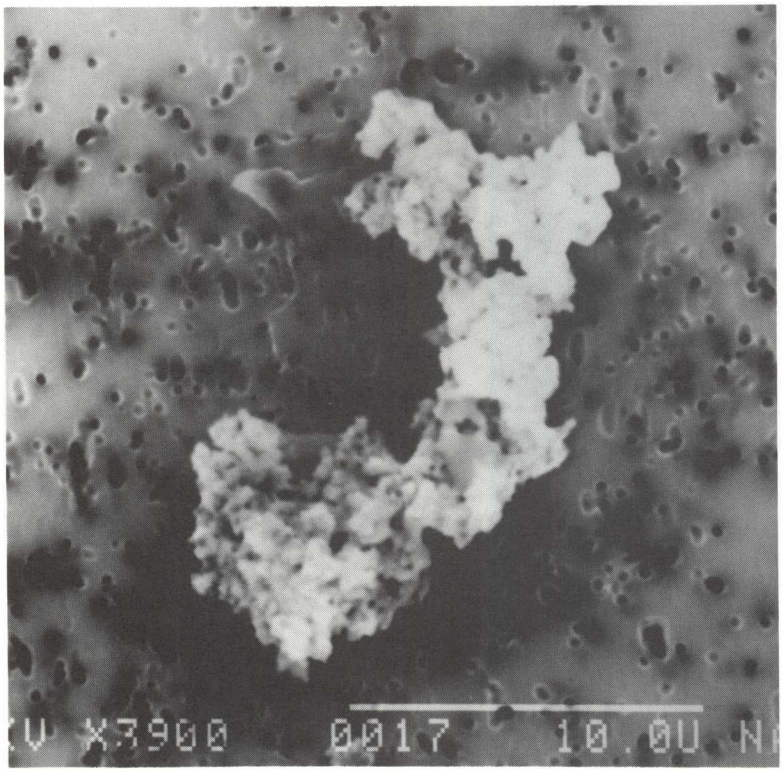
LUSTER: D/SM

TYPE: C

COMMENTS:
Cluster 11.
Largest particle
is 7 microns



L2011 D 5



S-92-35870

SIZE: 17x6

SHAPE: I

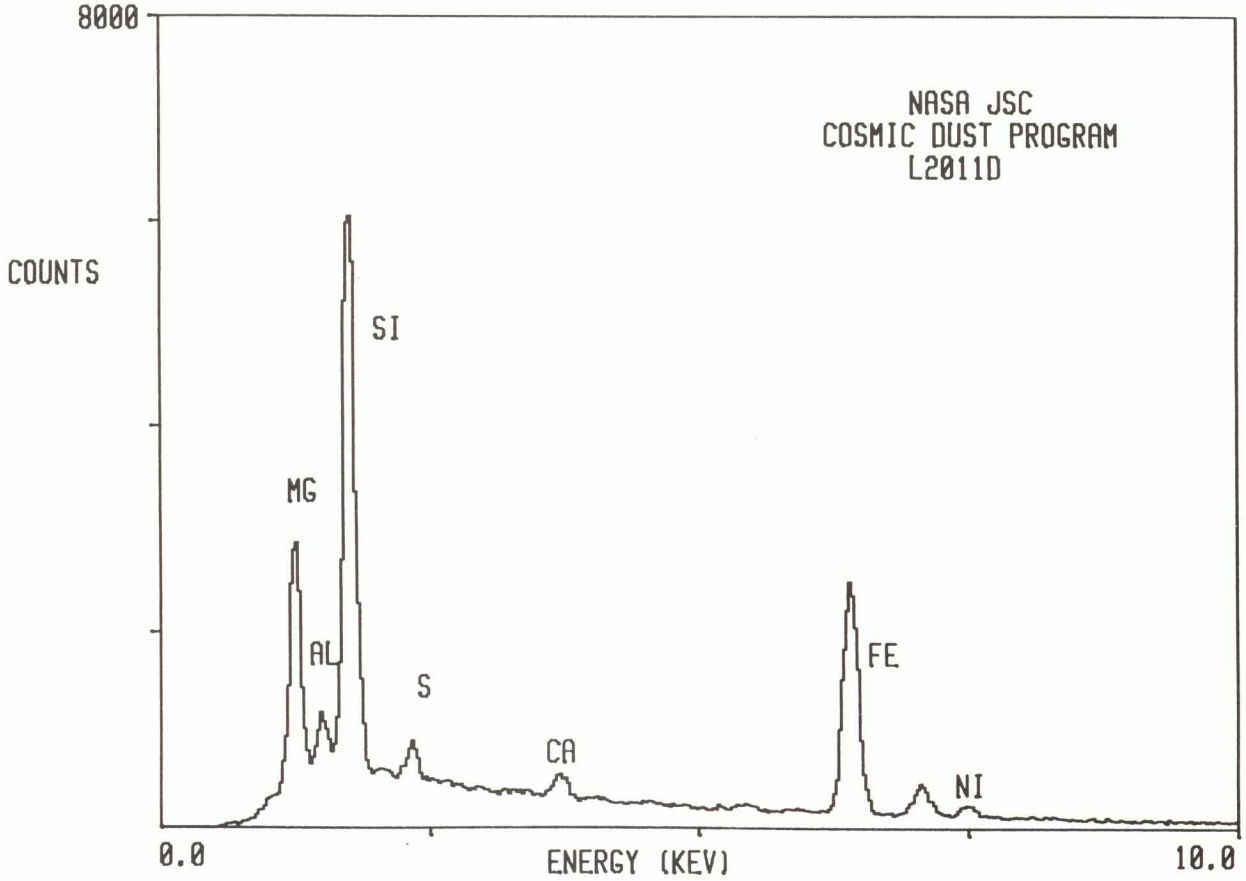
TRANS.: TL

COLOR: Orange to Black

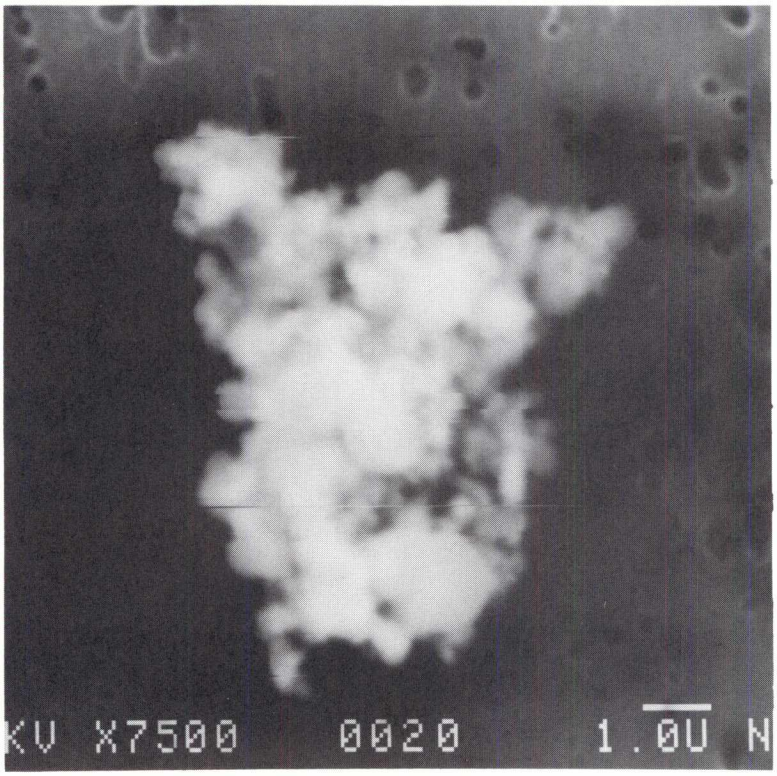
LUSTER: R

TYPE: C

COMMENTS:
Cluster 15



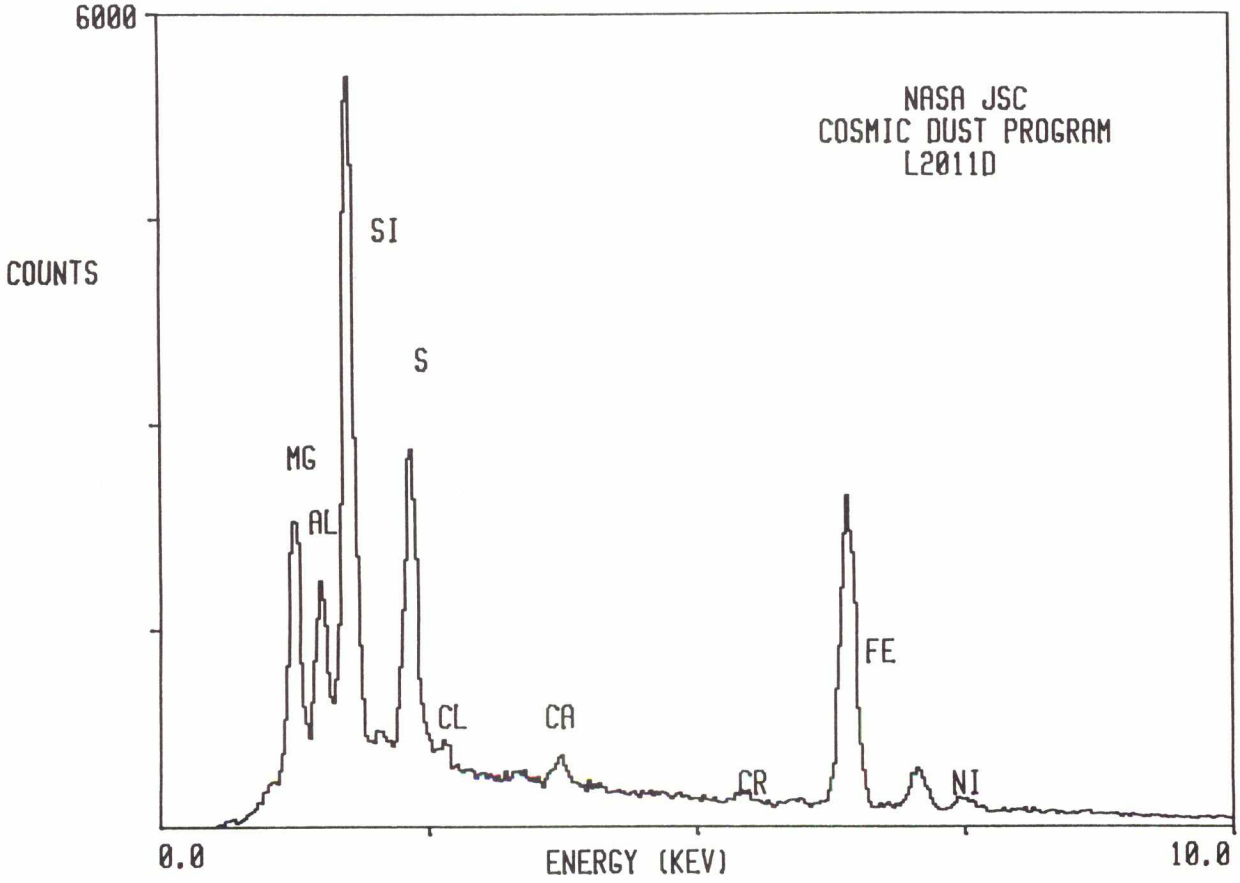
L2011 D 6



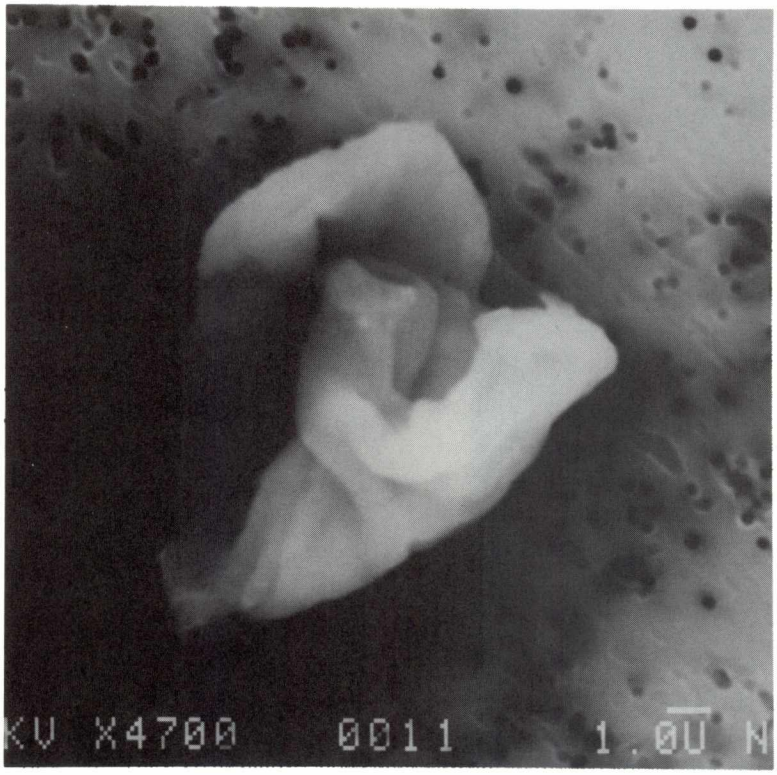
S-92-35871

SIZE: 8x4
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:
Cluster 16



L2011 E 1



S-92-35859

SIZE: 13

SHAPE: E

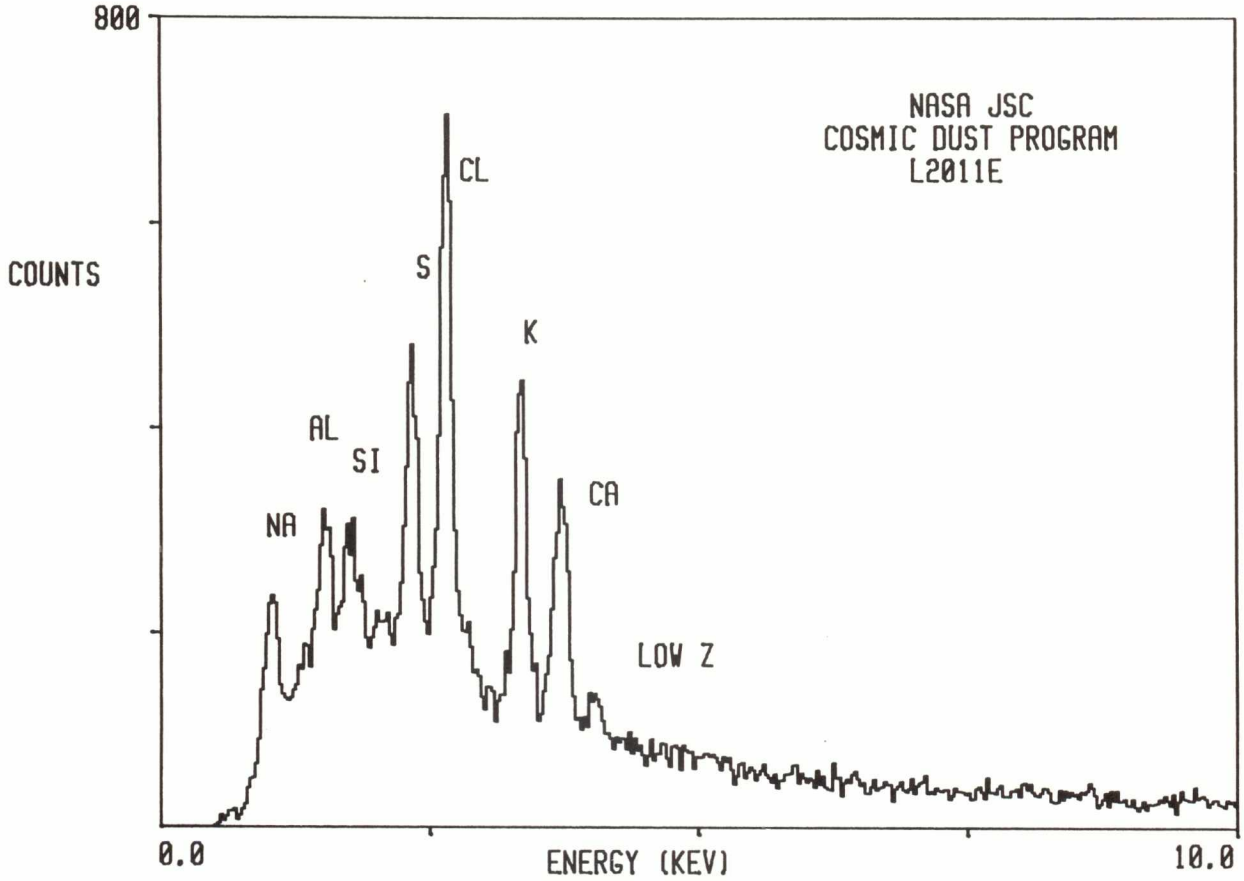
TRANS.: T

COLOR: Colorless

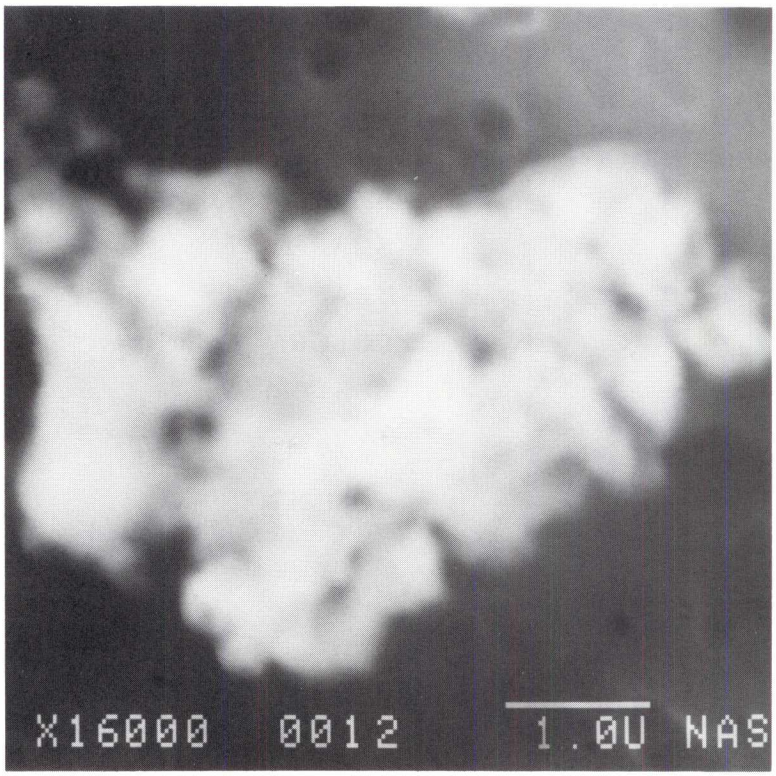
LUSTER: V

TYPE: C?

COMMENTS:
Cluster 17? Found adjacent to L2011 E2



L2011 E 2



S-92-35860

SIZE: 5x4

SHAPE: I

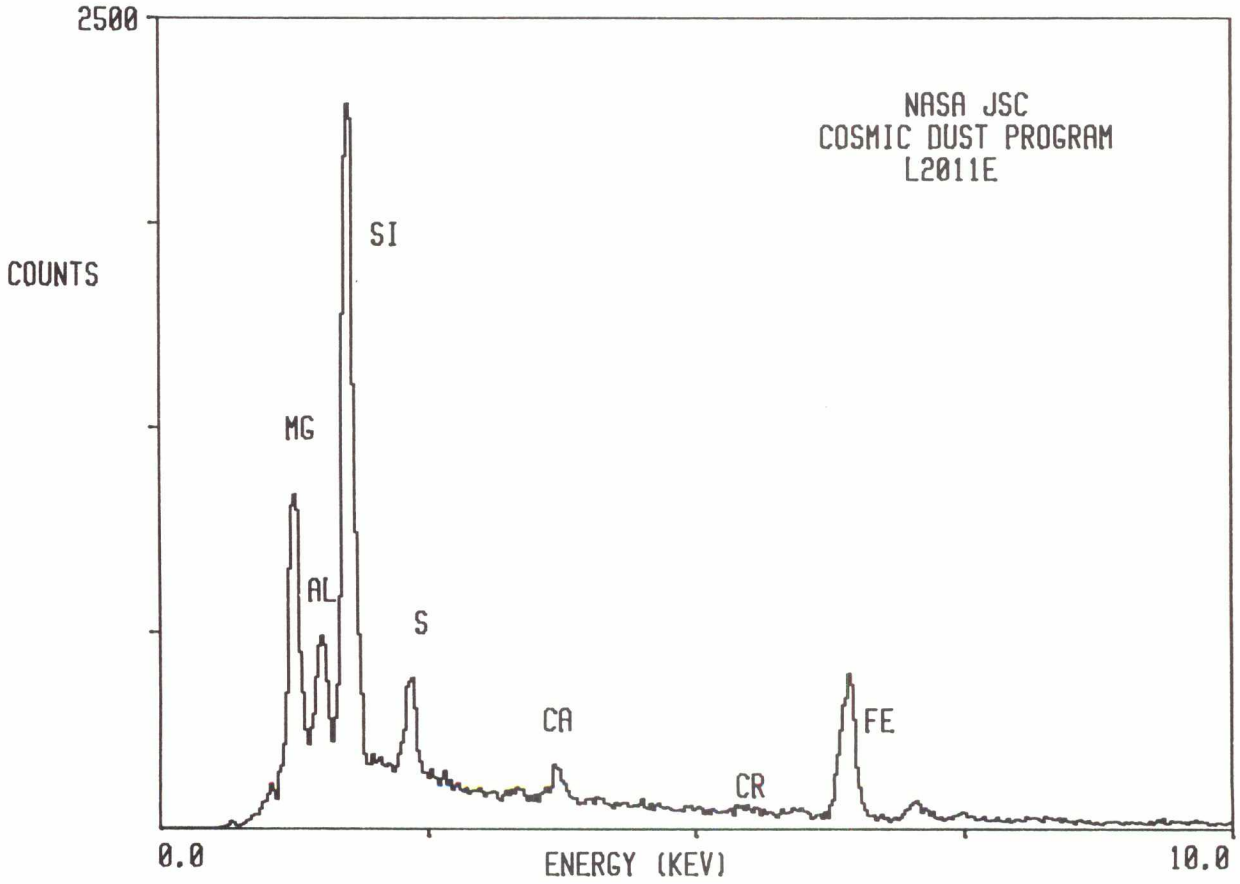
TRANS.: T

COLOR: Black

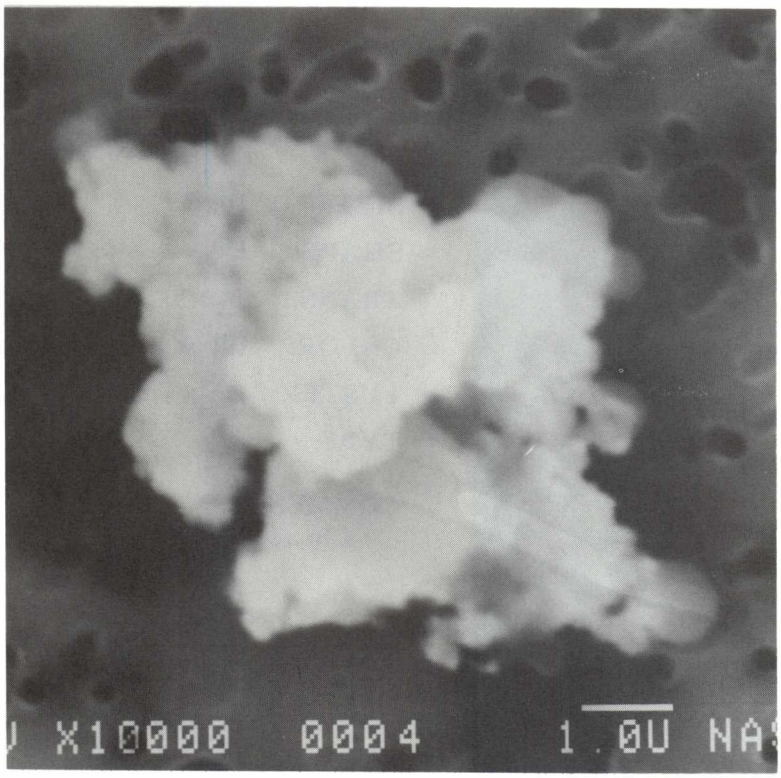
LUSTER: D

TYPE: C

COMMENTS:
Cluster 17. Found adjacent to L2011 E1



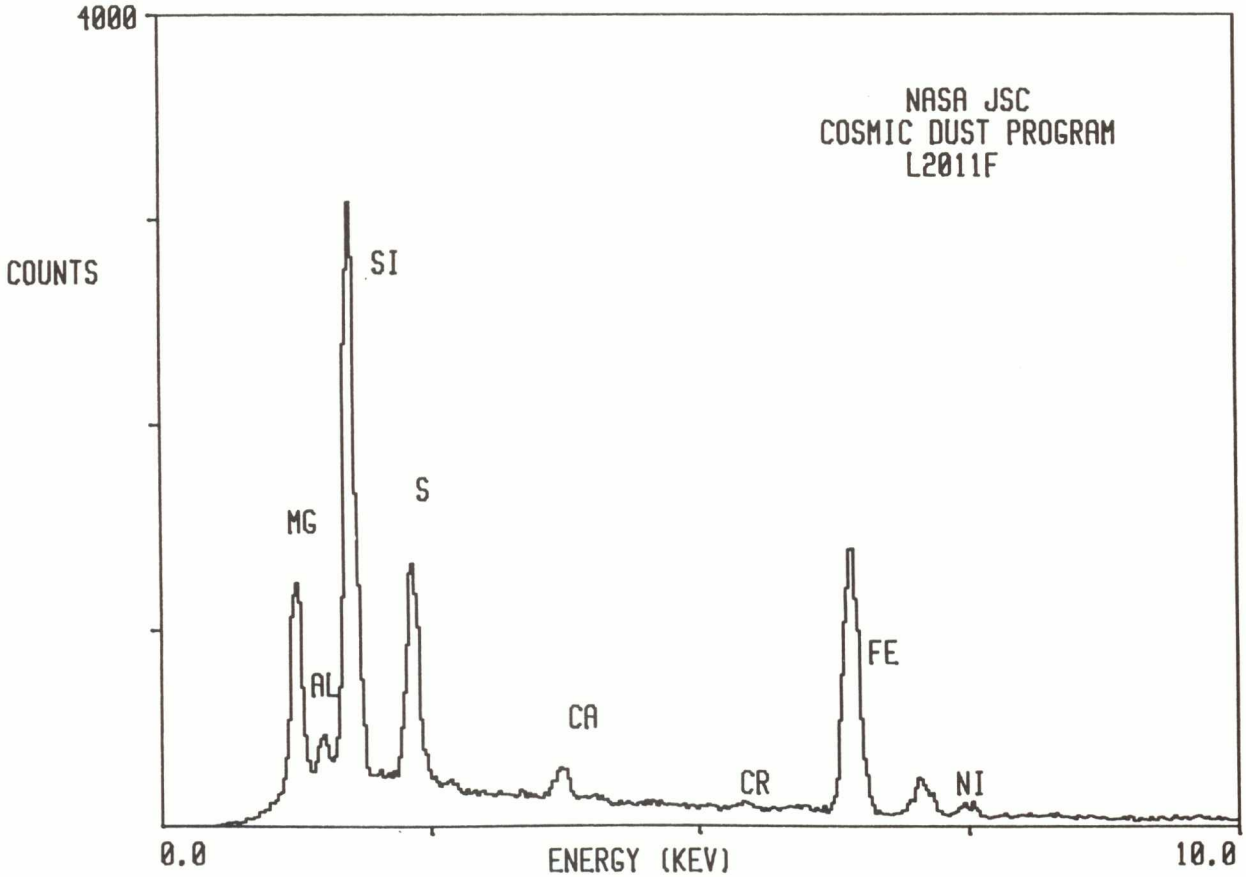
L2011 F 1



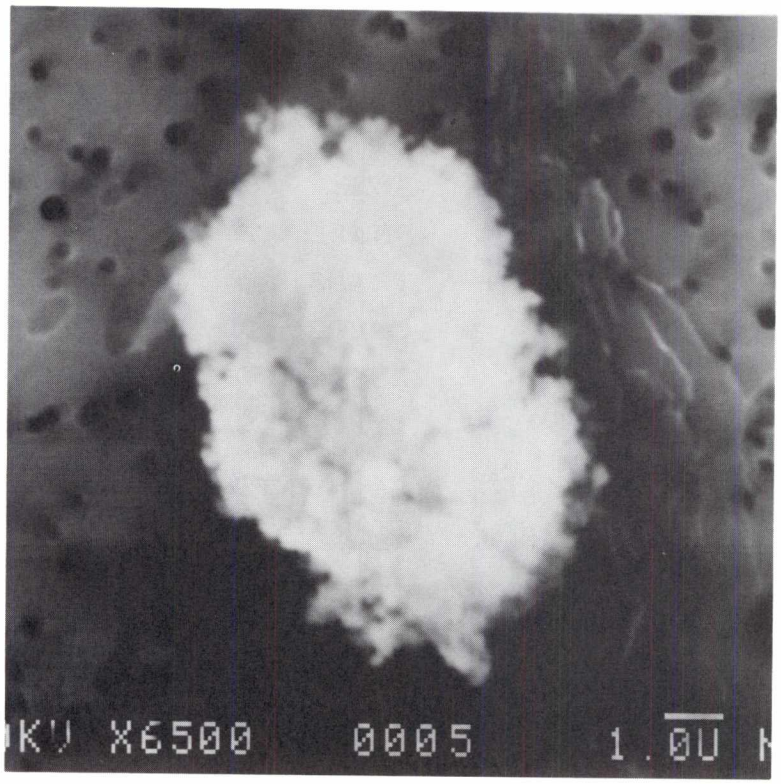
S-92-35856

SIZE: 8x6
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:
Cluster 21



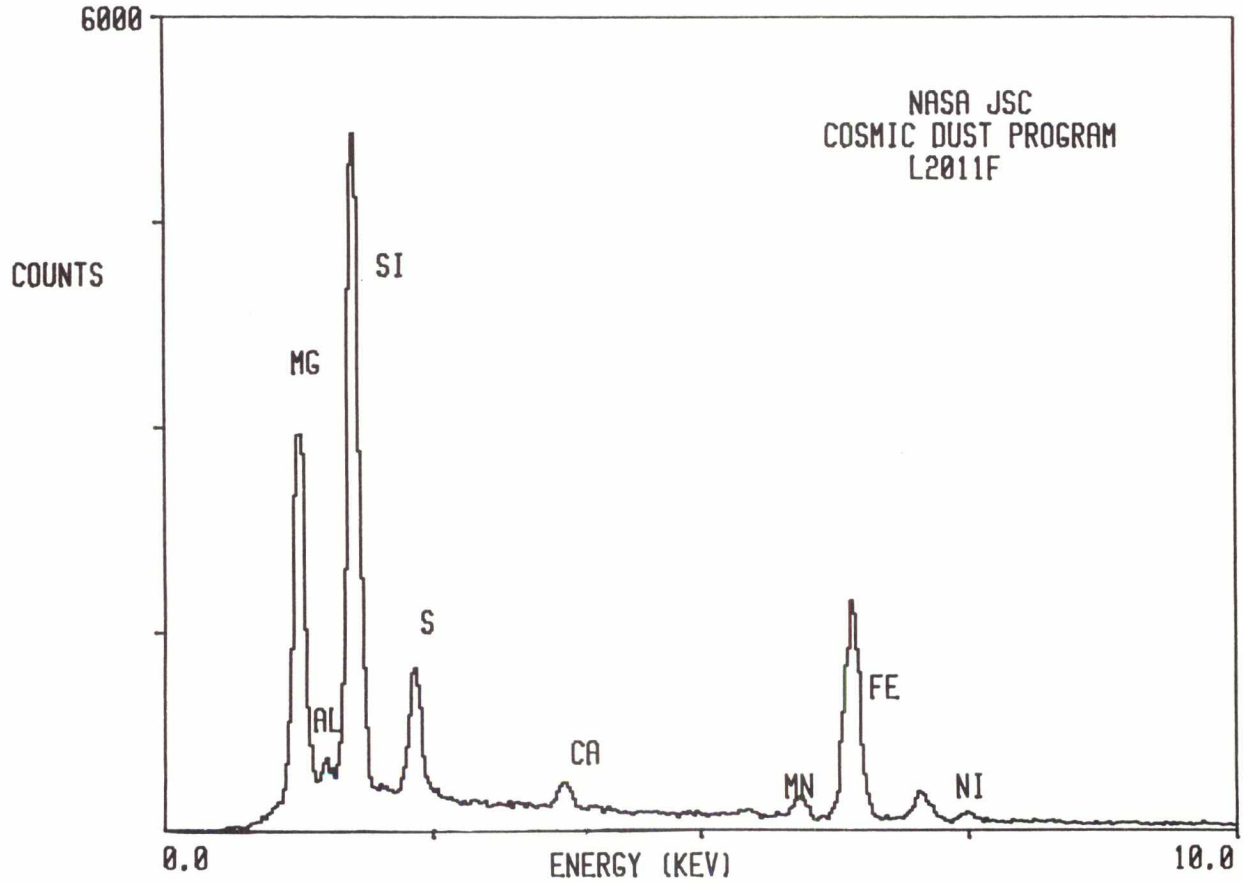
L2011 F 2



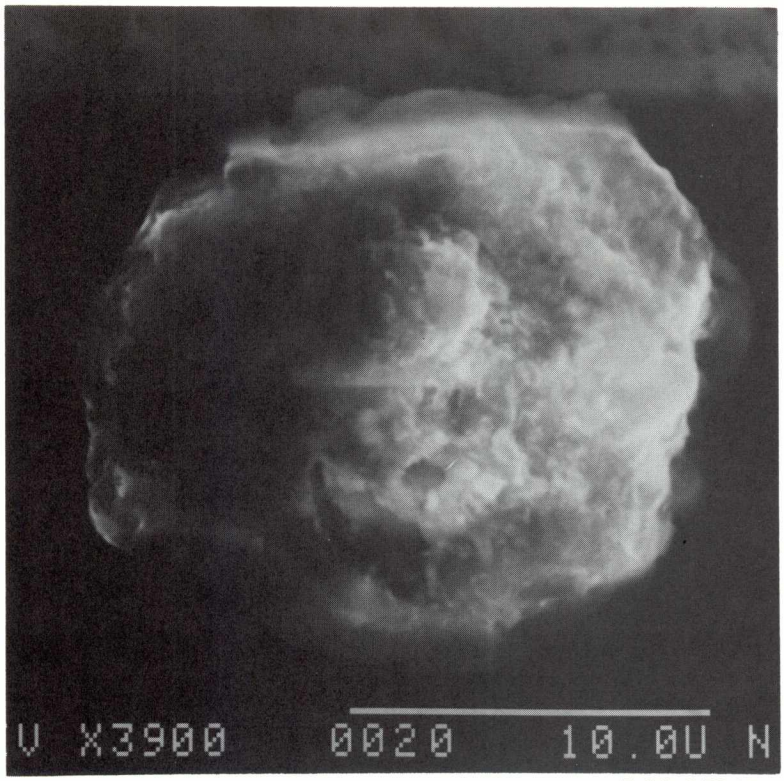
S-92-35857

SIZE: 10x6
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:
Cluster 22



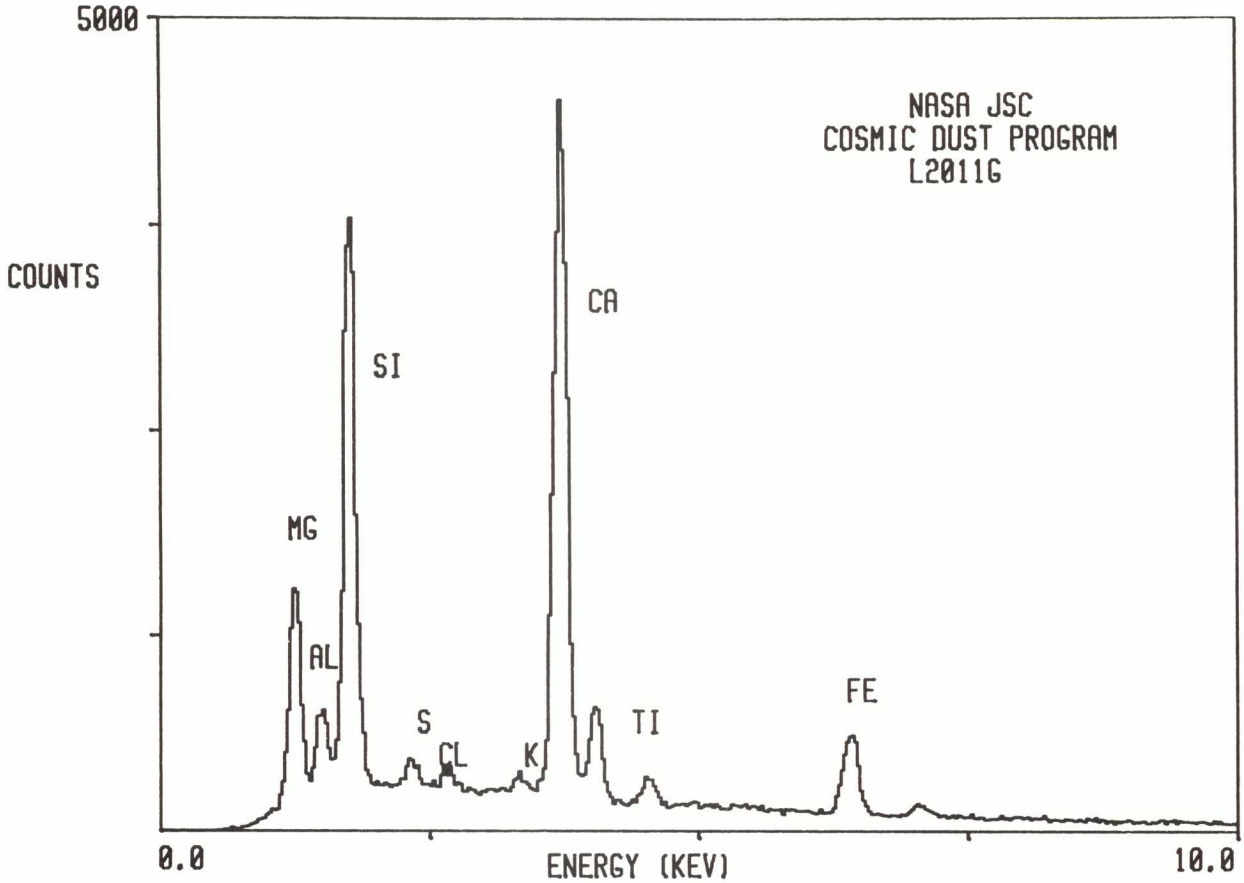
L2011 G 6



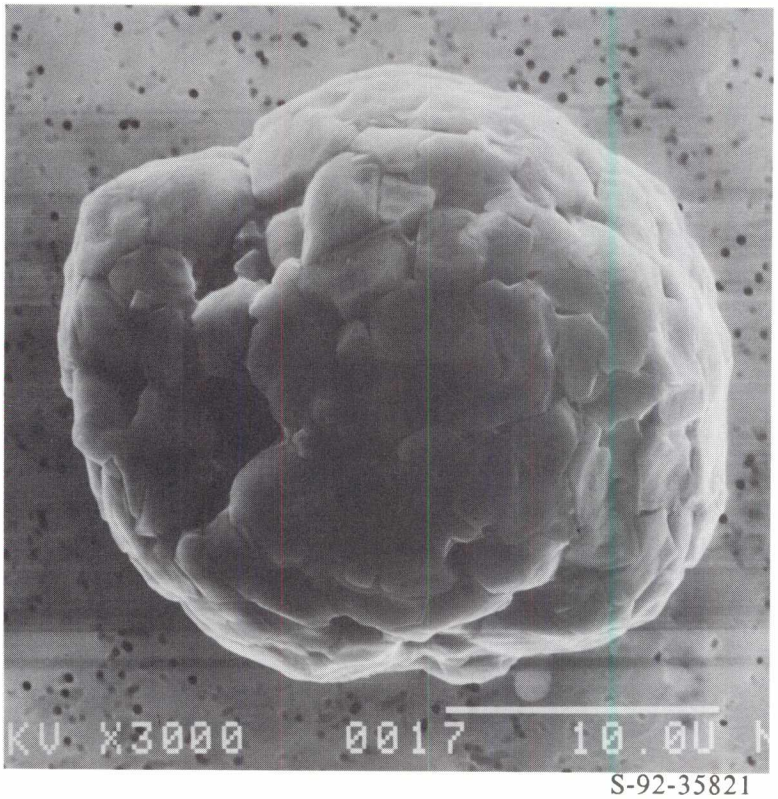
S-92-35849

SIZE: 20
SHAPE: S/E
TRANS.: TL
COLOR: White
LUSTER: V
TYPE: C?

COMMENTS:



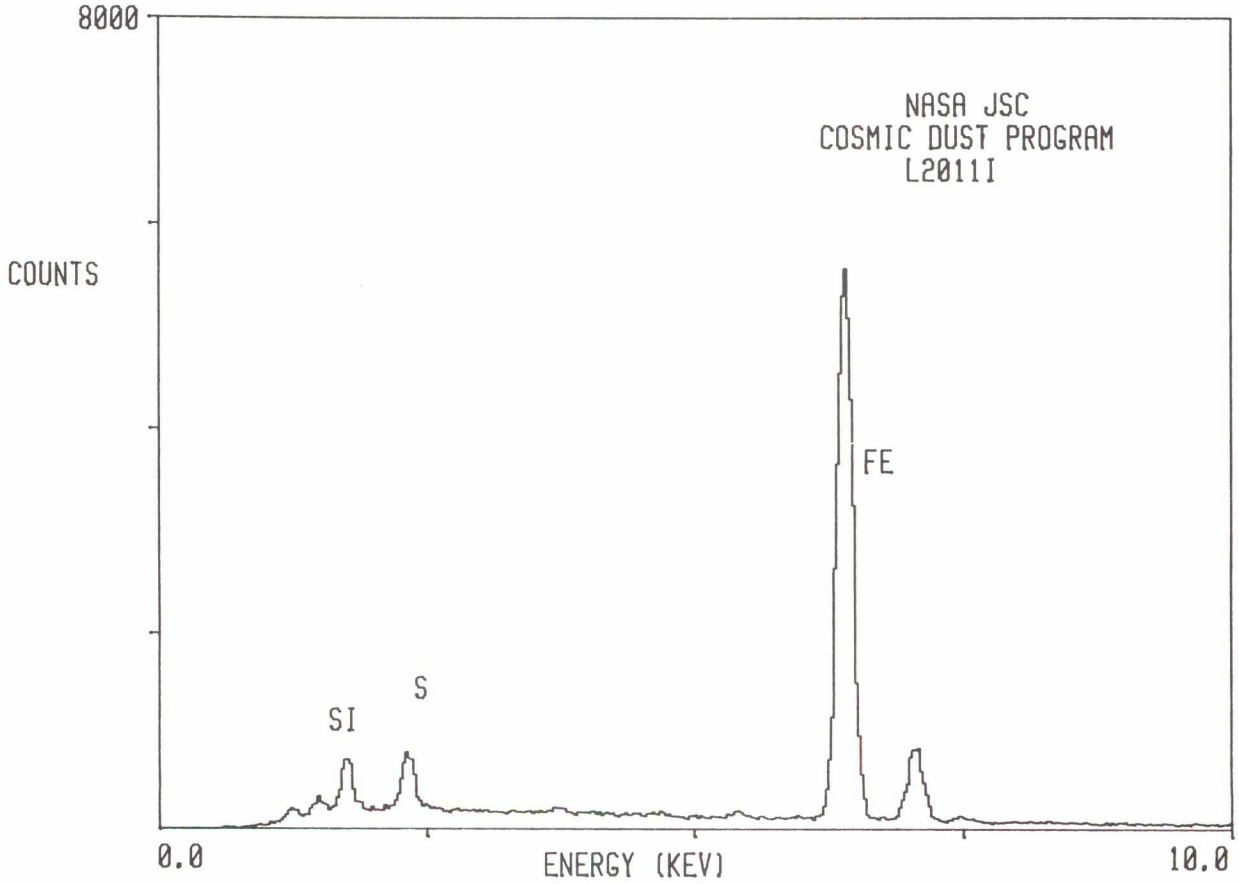
L2011 I 7



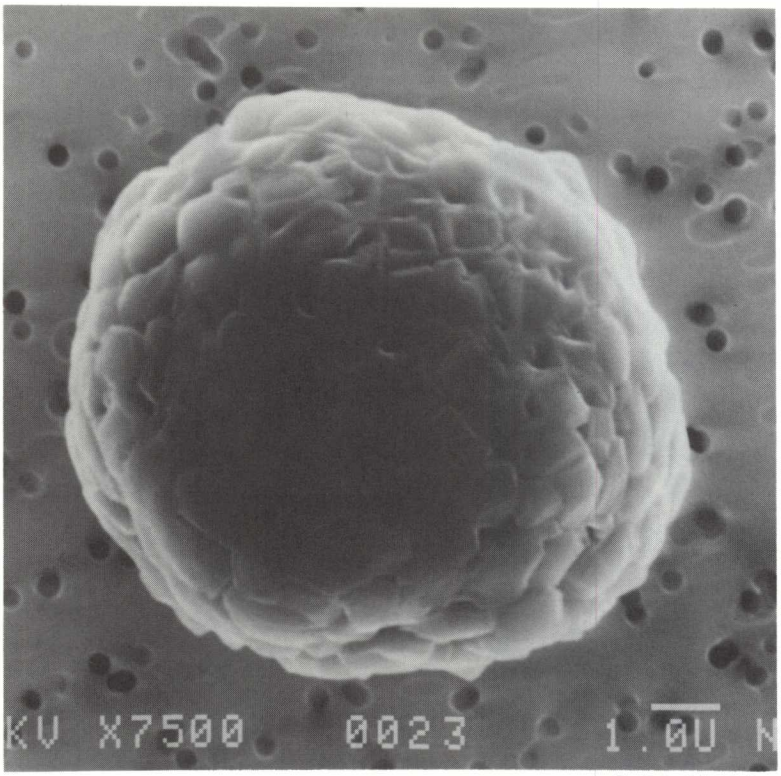
S-92-35821

SIZE: 24
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: SM
TYPE: C

COMMENTS:



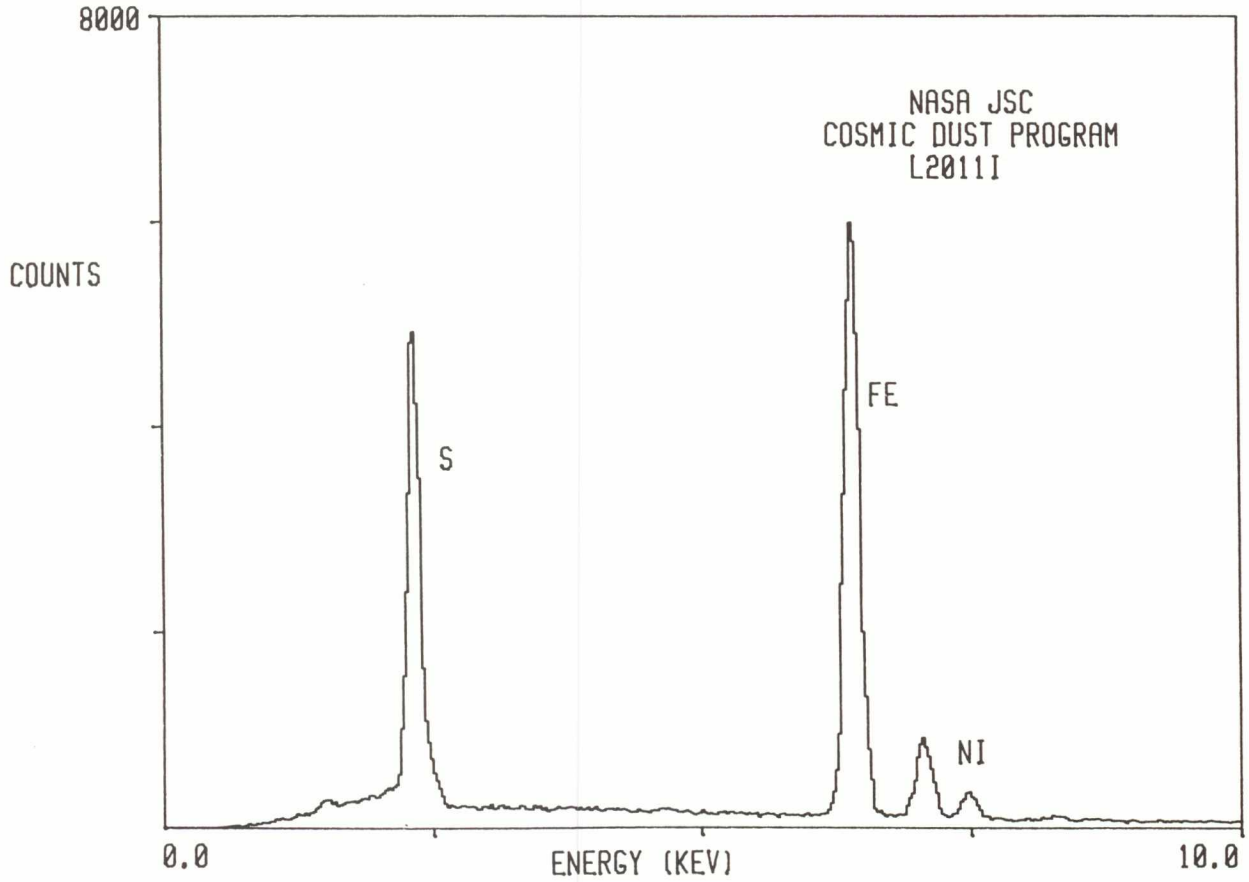
L2011 I 8



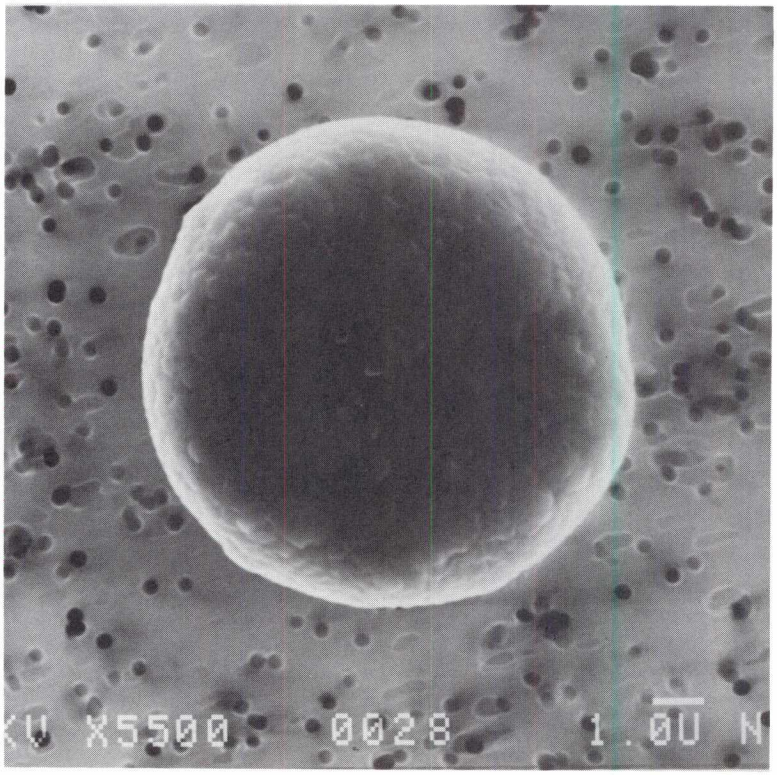
S-92-35823

SIZE: 9
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: SM
TYPE: C

COMMENTS:



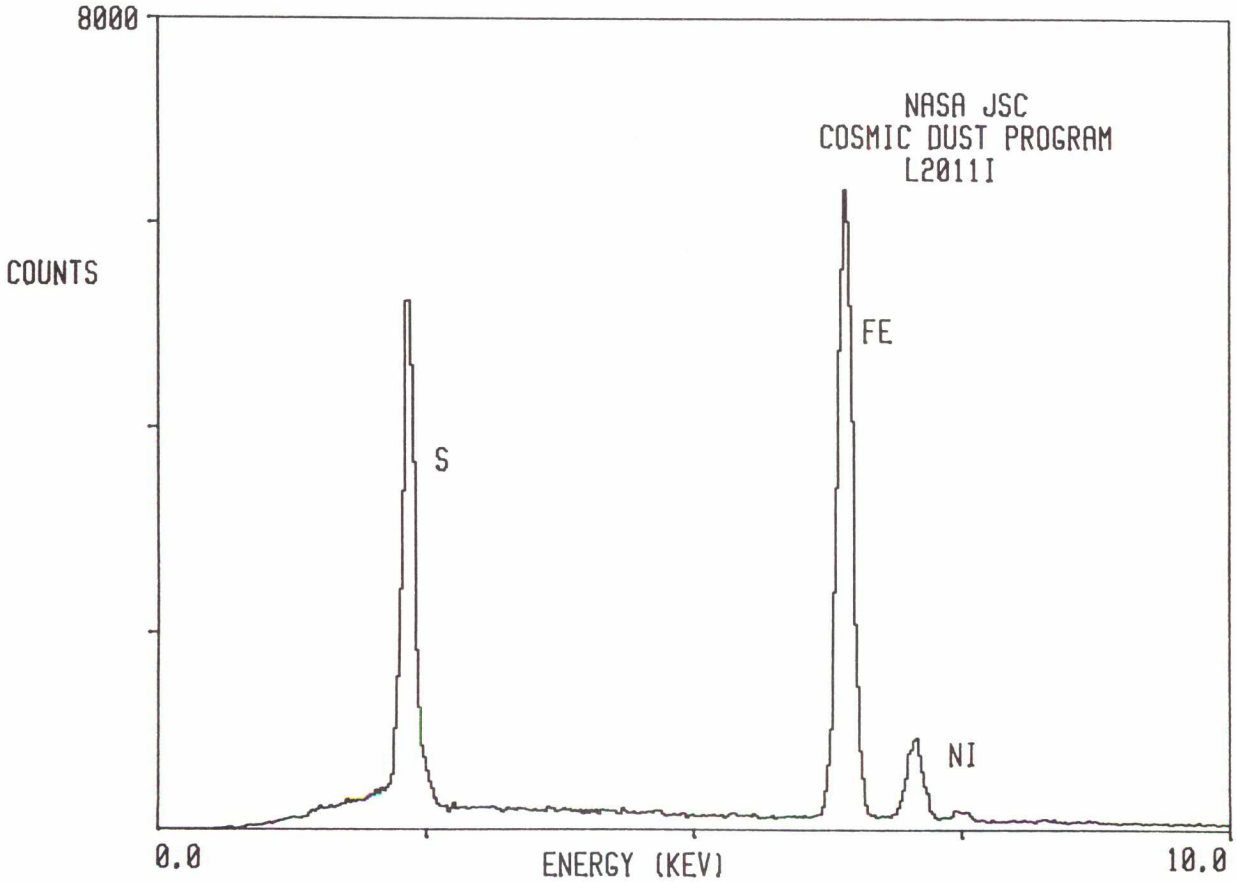
L2011 I 9



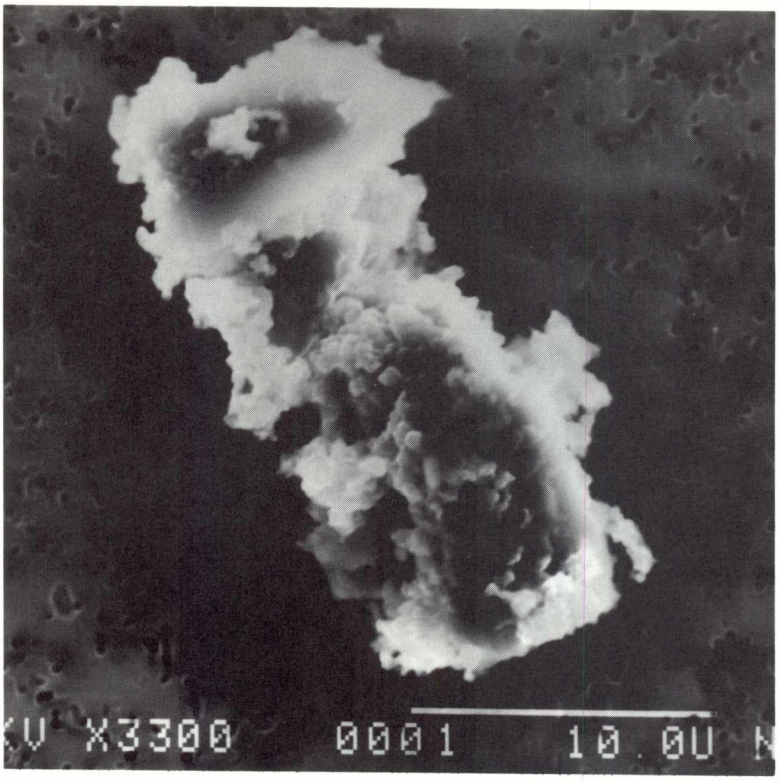
S-92-35824

SIZE: 11
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: SM
TYPE: C

COMMENTS:



L2011 J 1



S-92-35800

SIZE: 24x11

SHAPE: E

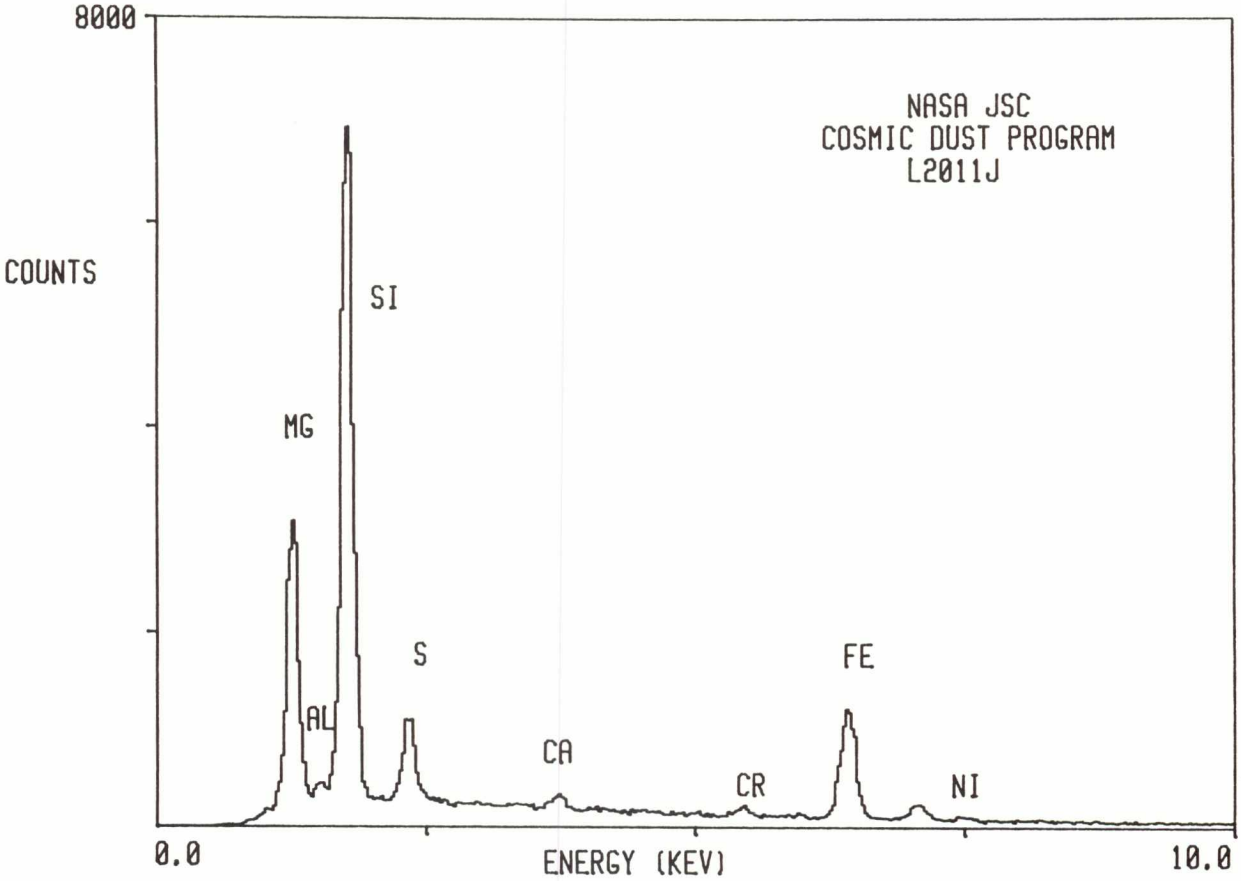
TRANS.: O

COLOR: Black to Brown

LUSTER: M/D

TYPE: C

COMMENTS:

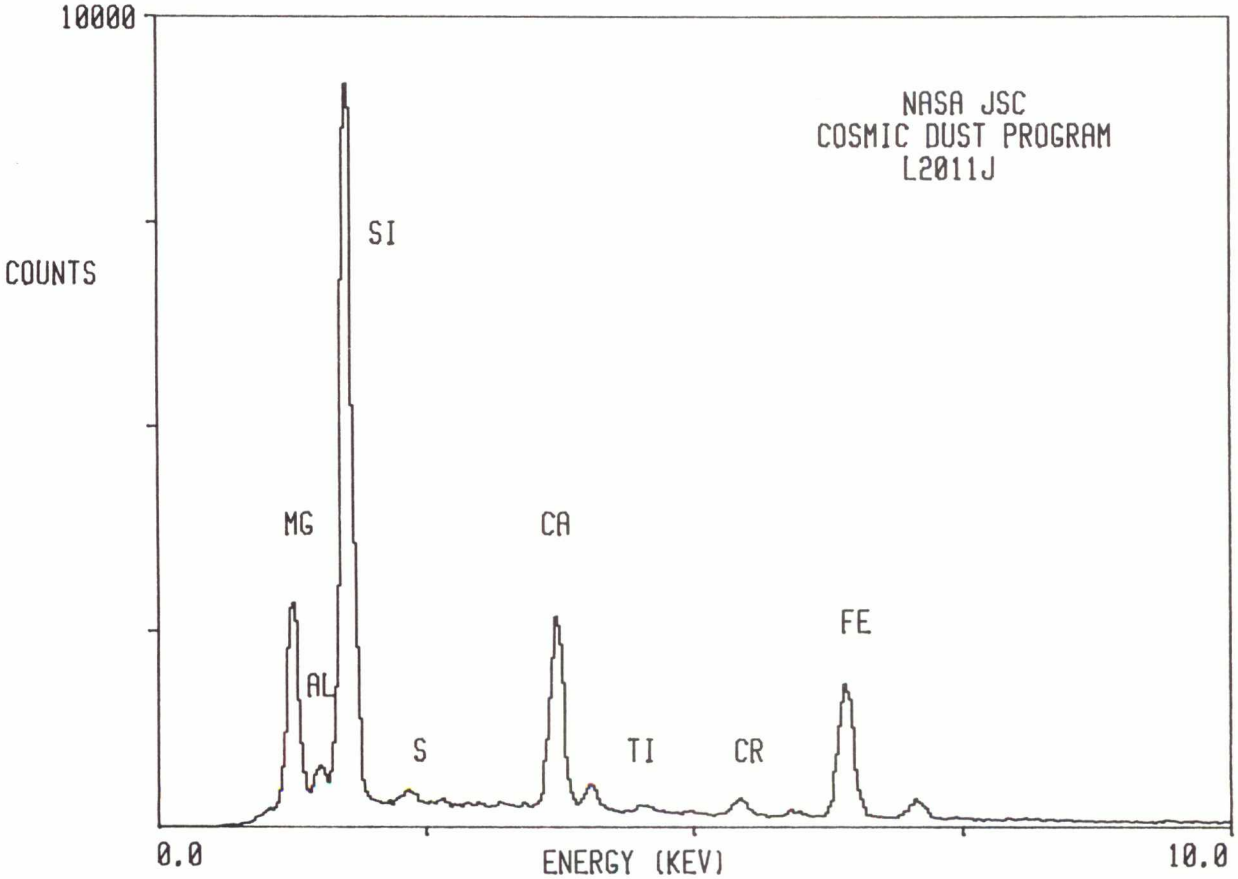


L2011 J 2

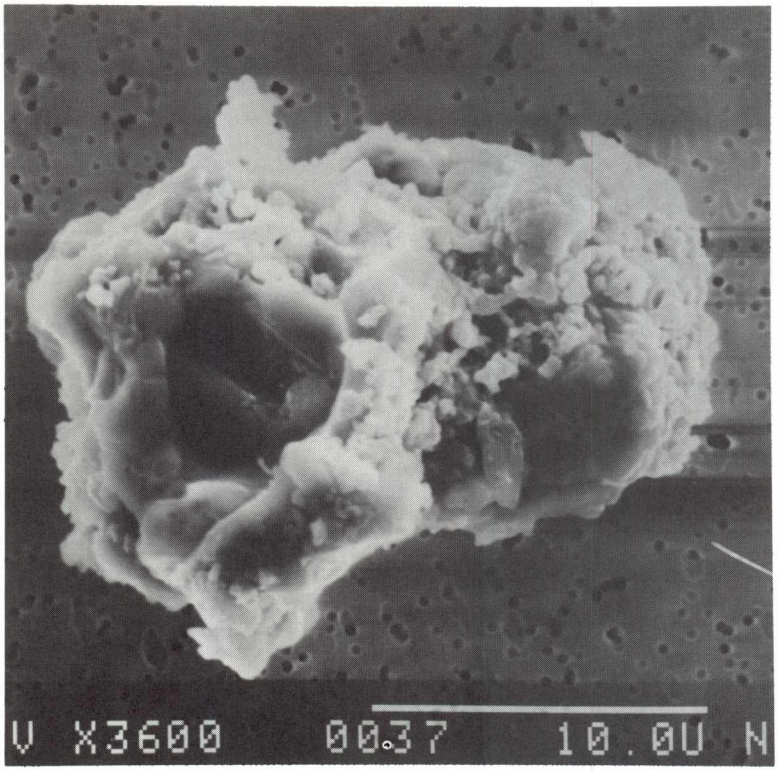
S-92-35801

SIZE: 26x15
SHAPE: E/I
TRANS.: O
COLOR: Black
LUSTER: M/D
TYPE: C

COMMENTS:



L2011 J 13



S-92-35812

SIZE: 25x20

SHAPE: I

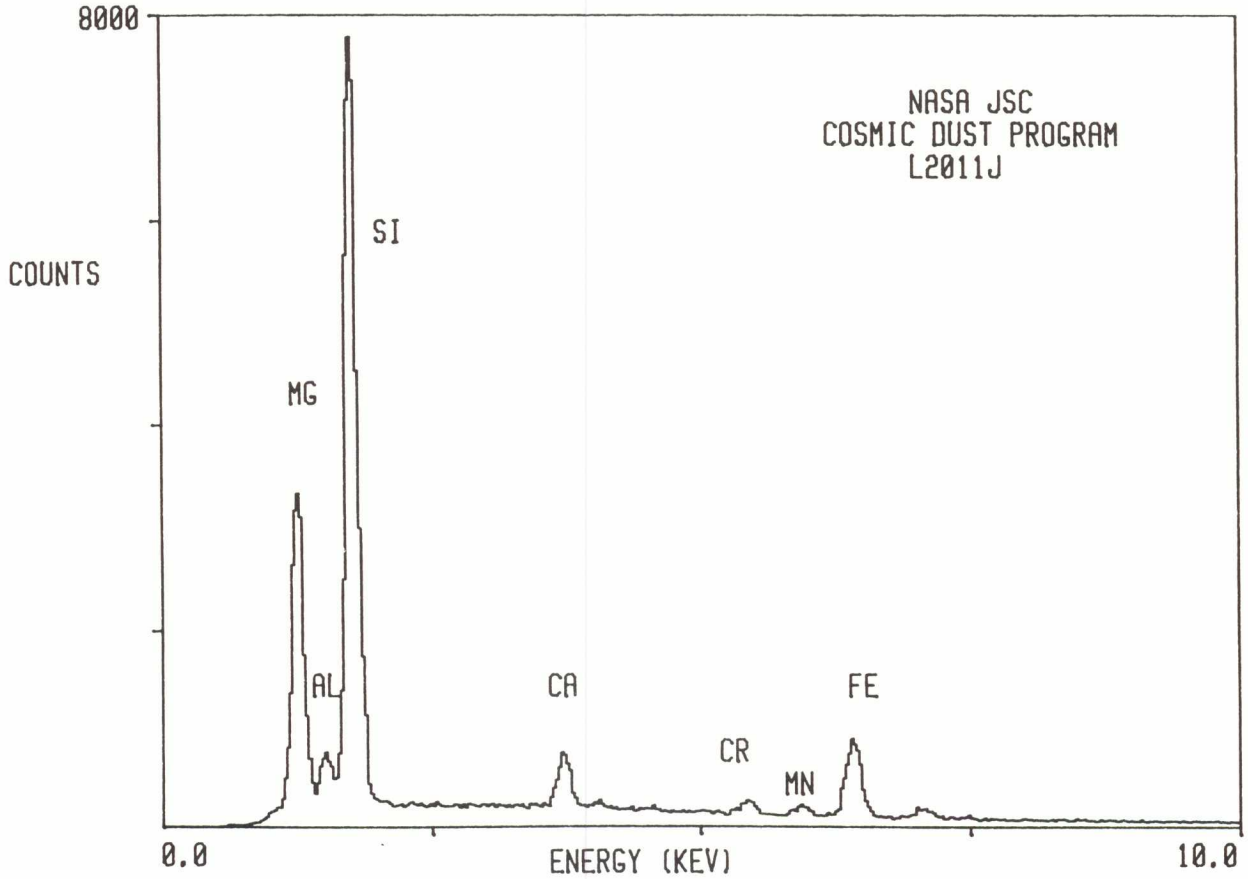
TRANS.: O

COLOR: Black to Brown

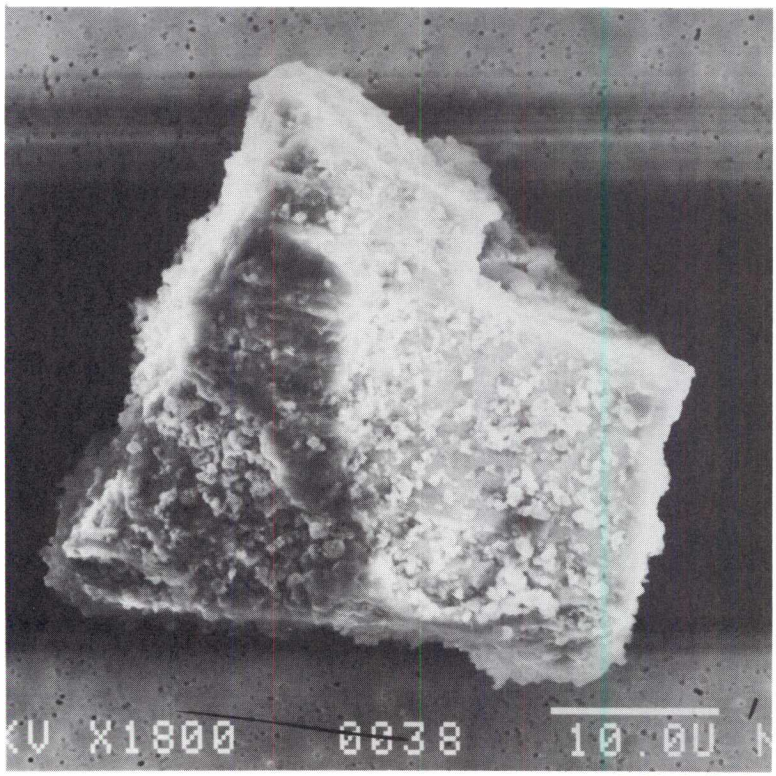
LUSTER: R

TYPE: C

COMMENTS:



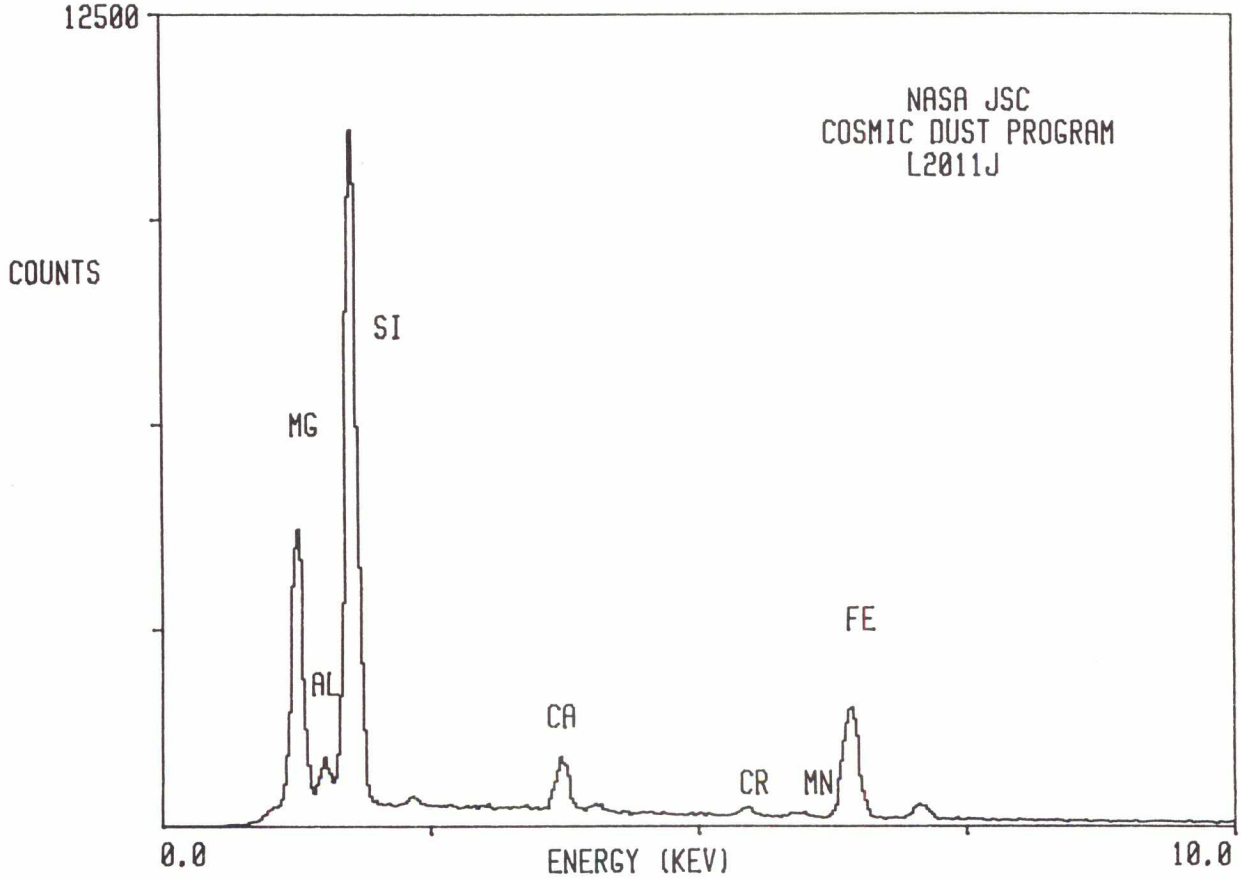
L2011 J 14



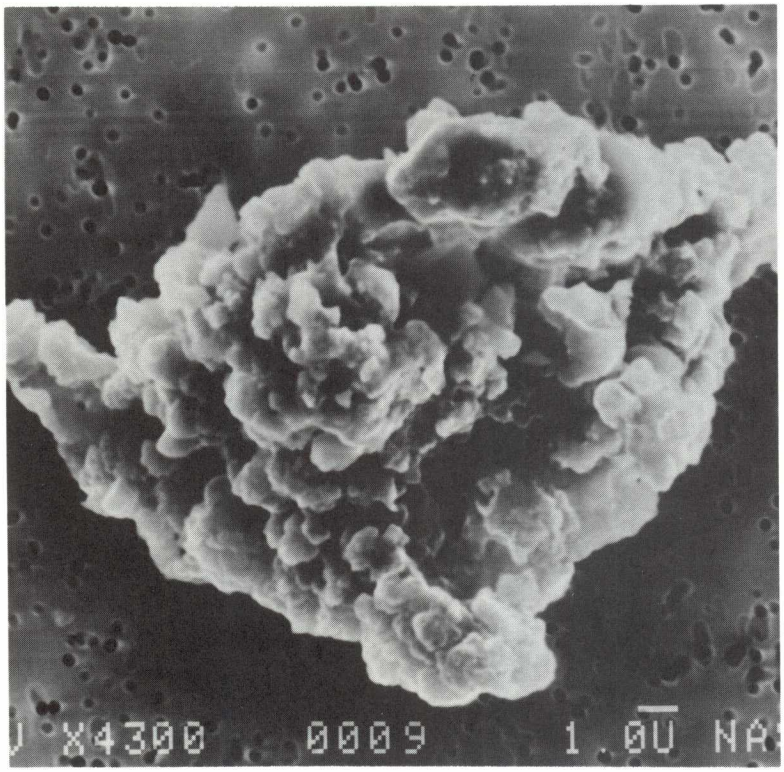
S-92-35813

SIZE: 19x17
SHAPE: E
TRANS.: TL
COLOR: Brown
LUSTER: D
TYPE: C

COMMENTS:



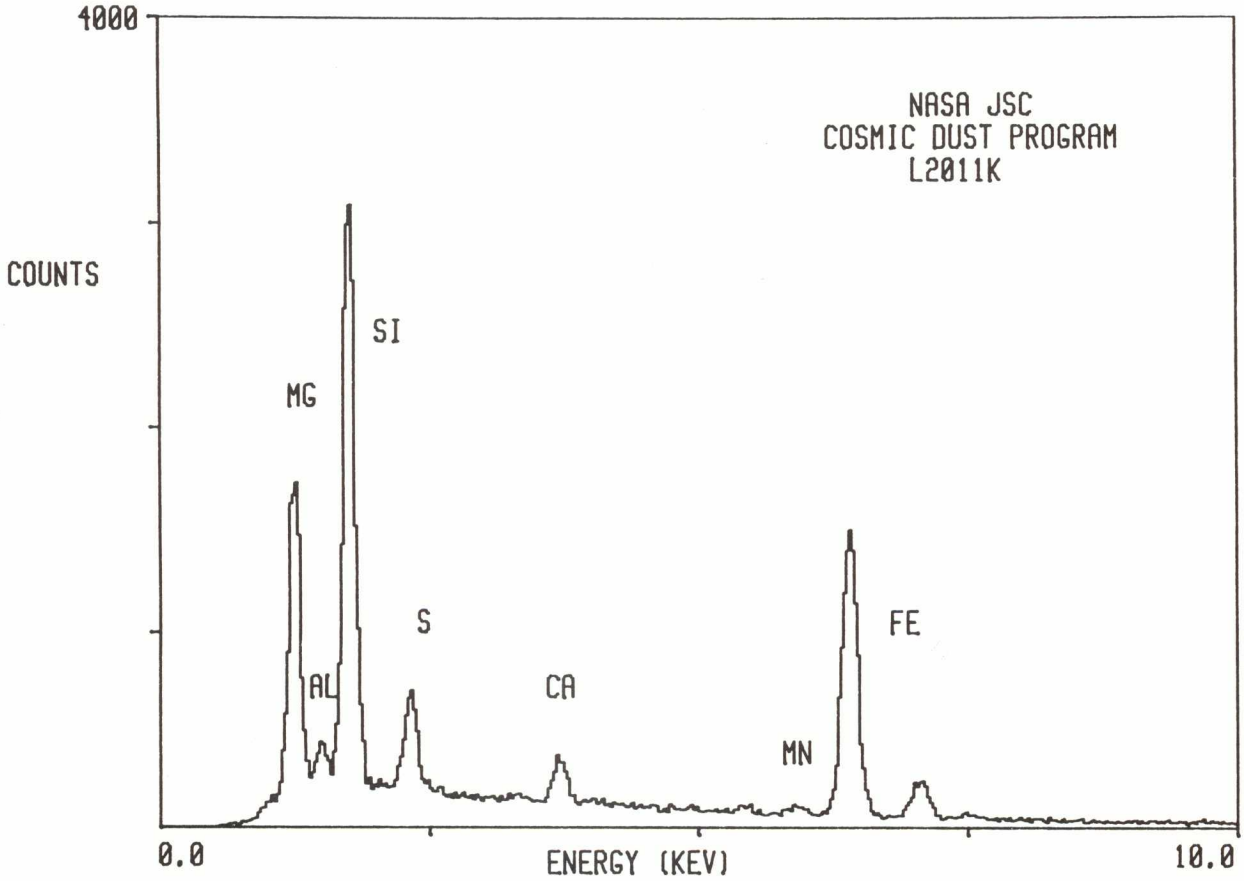
L2011 K 1



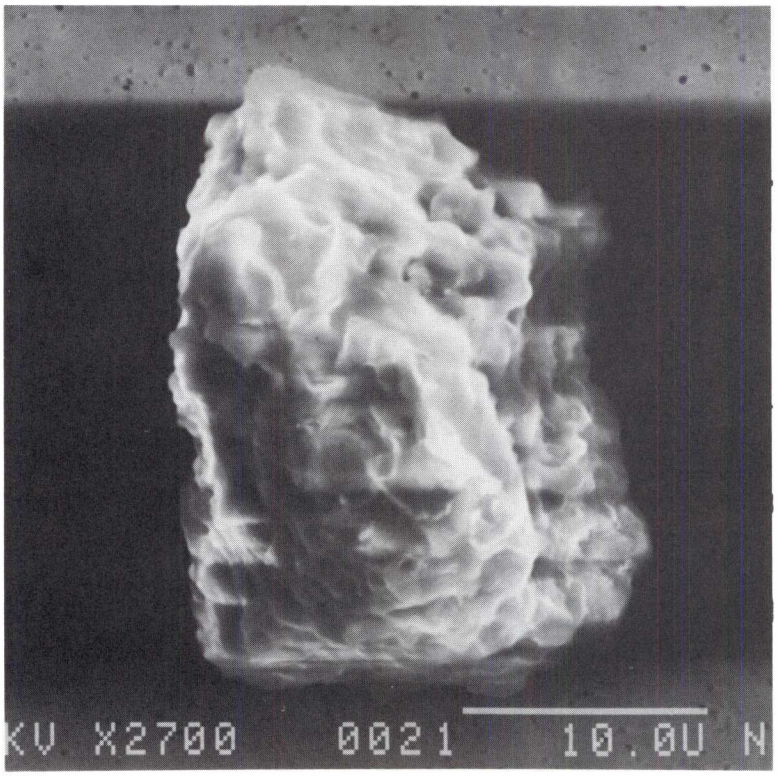
S-92-35783

SIZE: 22x18
SHAPE: E
TRANS.: O
COLOR: Brown
LUSTER: R
TYPE: C

COMMENTS:



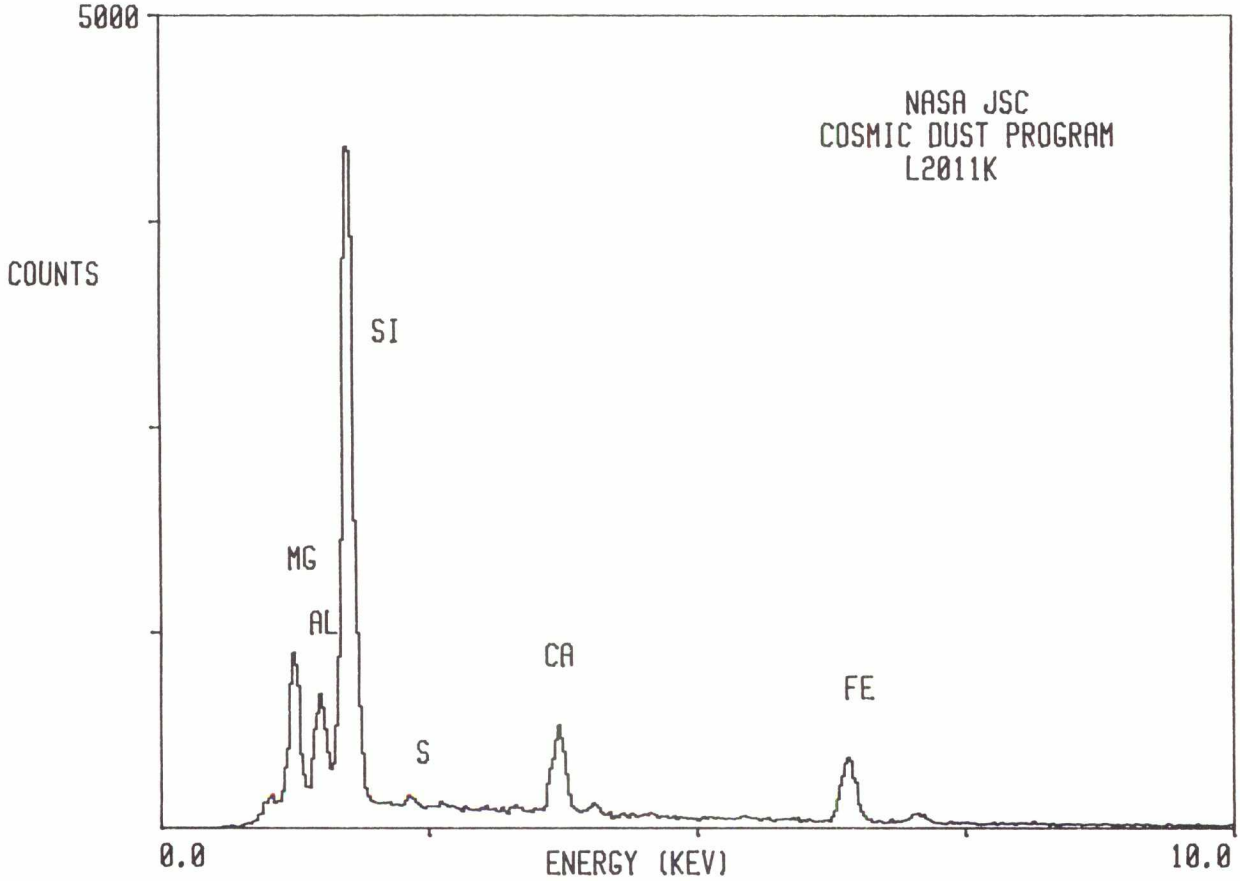
L2011 K 5



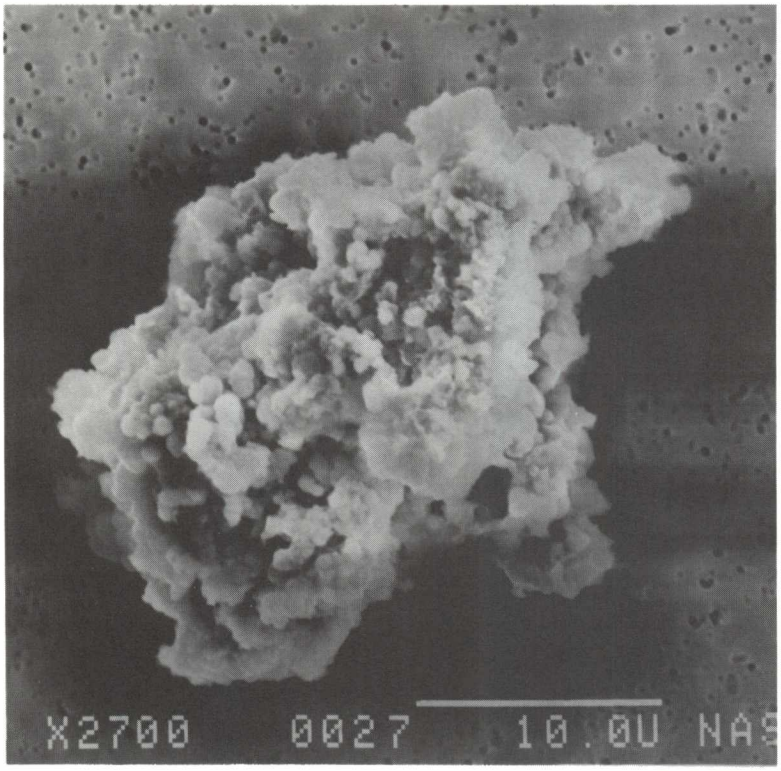
S-92-35787

SIZE: 26x20
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



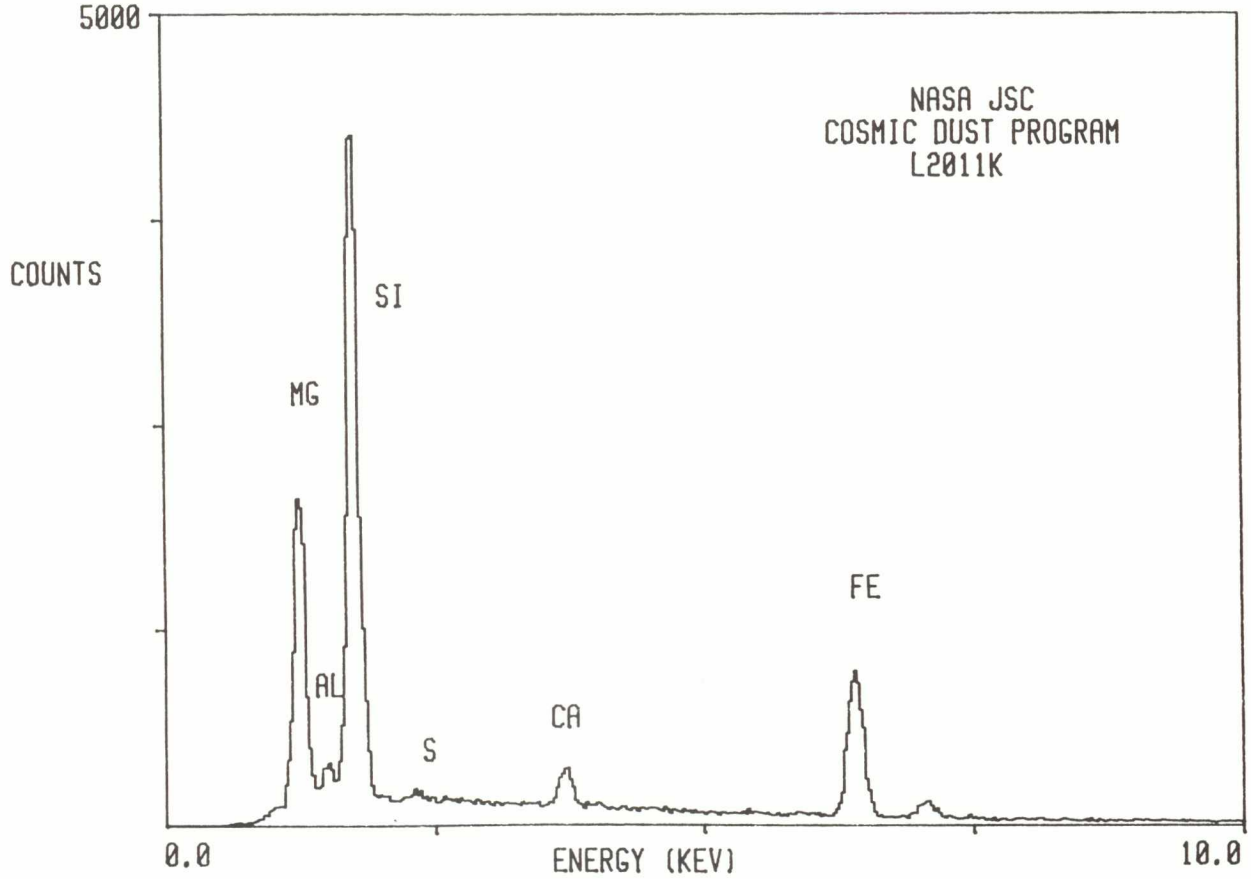
L2011 K 7



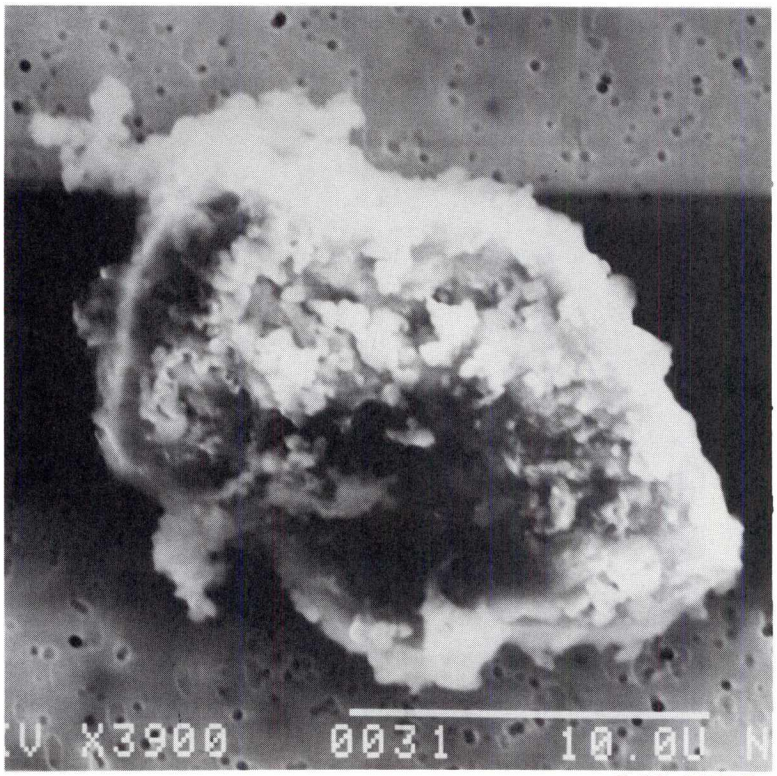
S-92-35789

SIZE: 28x20
SHAPE: E/I
TRANS.: TL
COLOR: Brown
LUSTER: R
TYPE: C

COMMENTS:



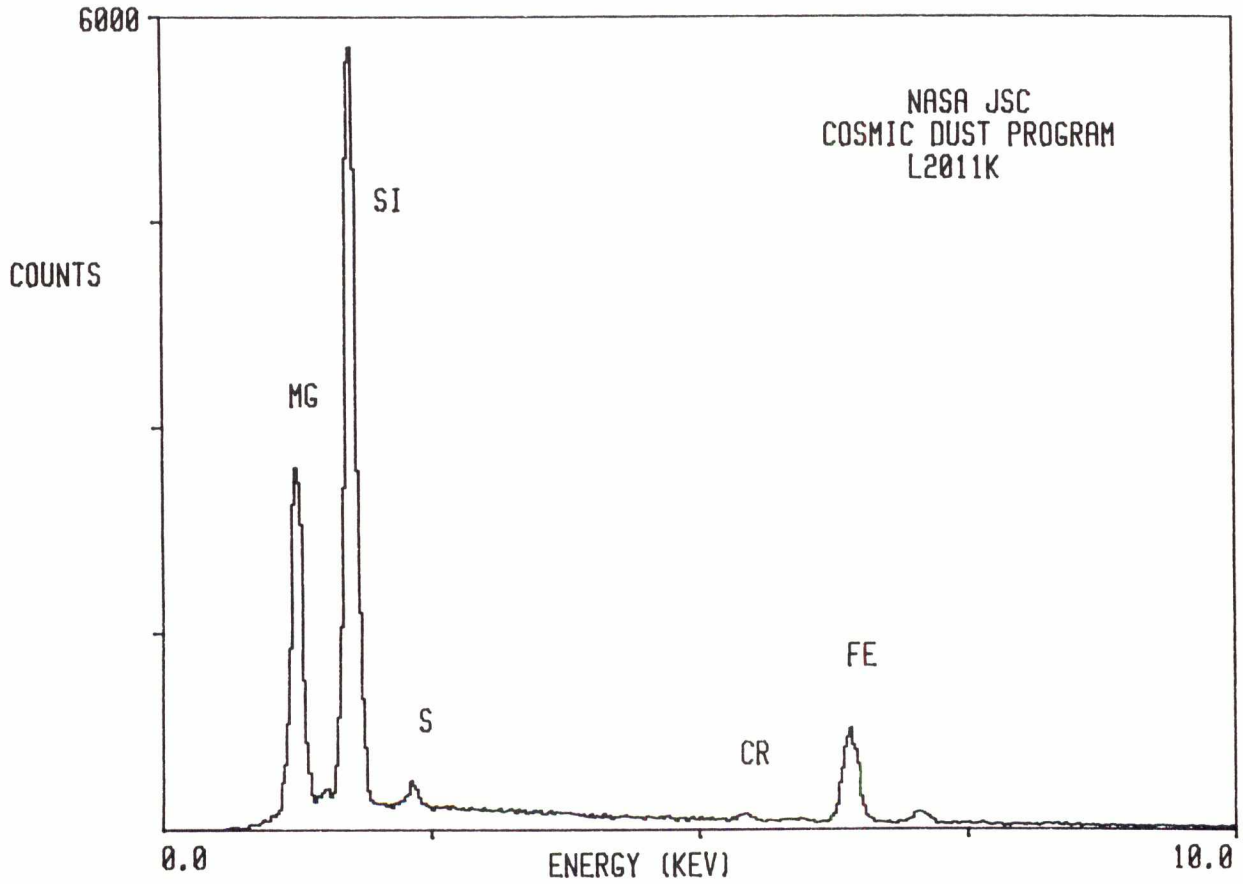
L2011 K 17



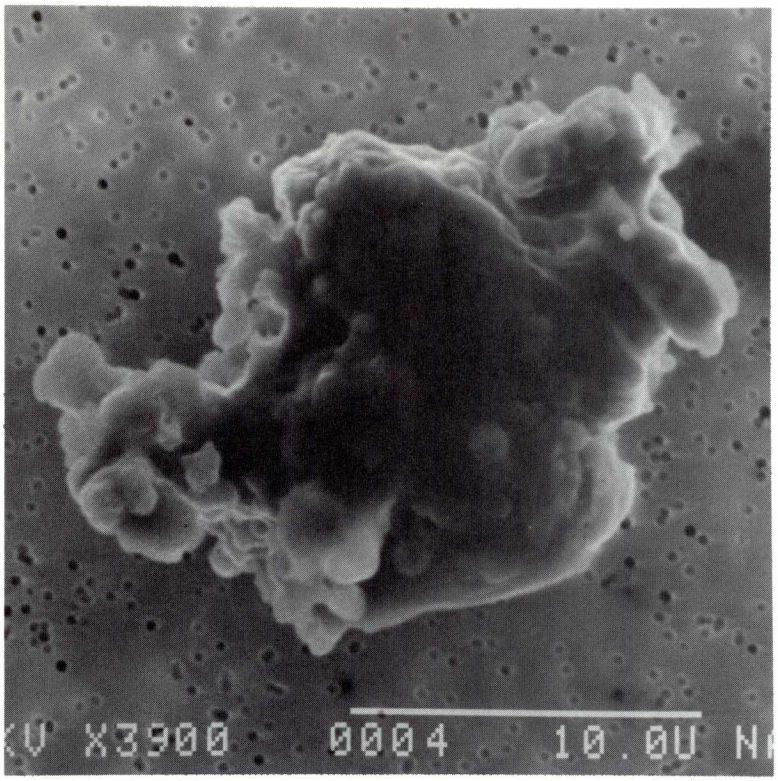
S-92-35799

SIZE: 25x15
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



L2011 L 2



S-92-35773

SIZE: 22x13

SHAPE: I

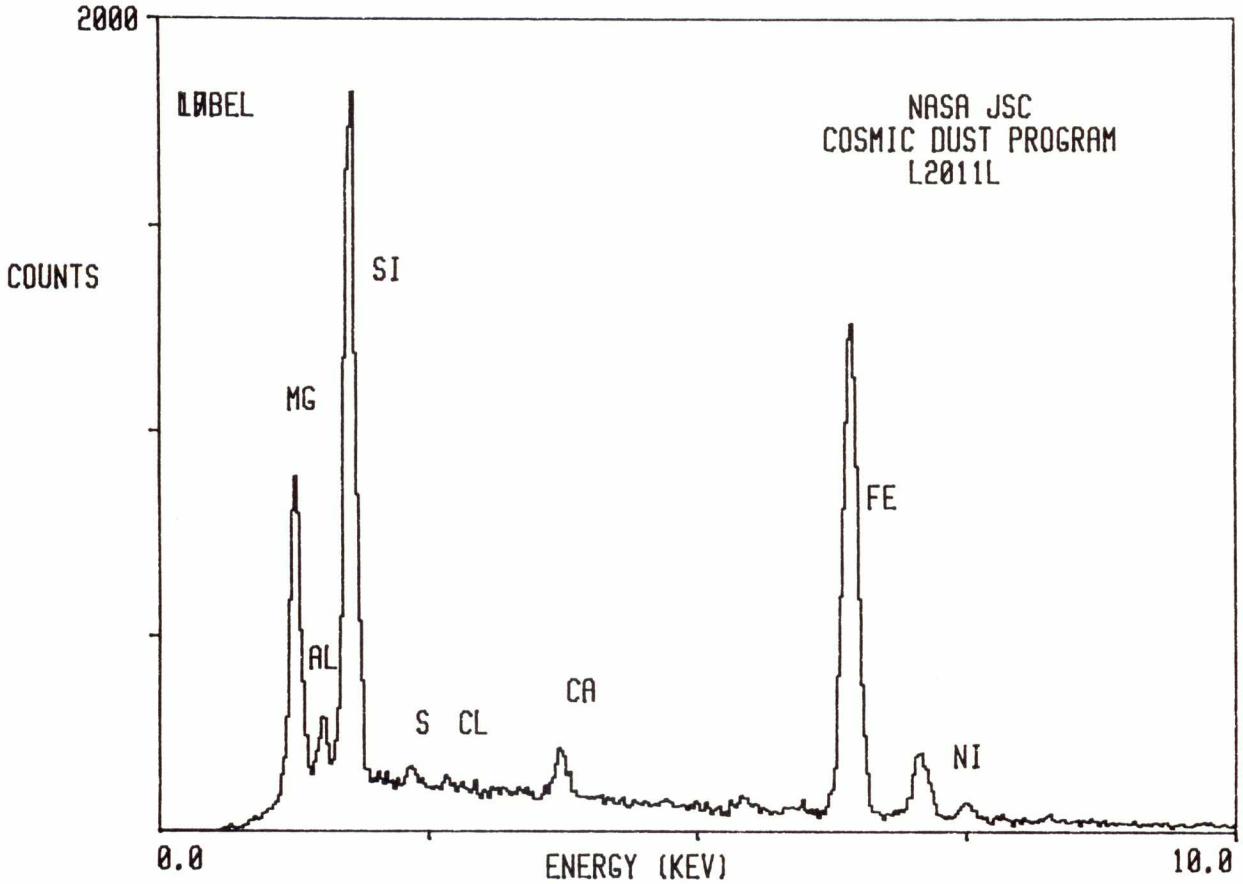
TRANS.: O

COLOR: Black to Grey

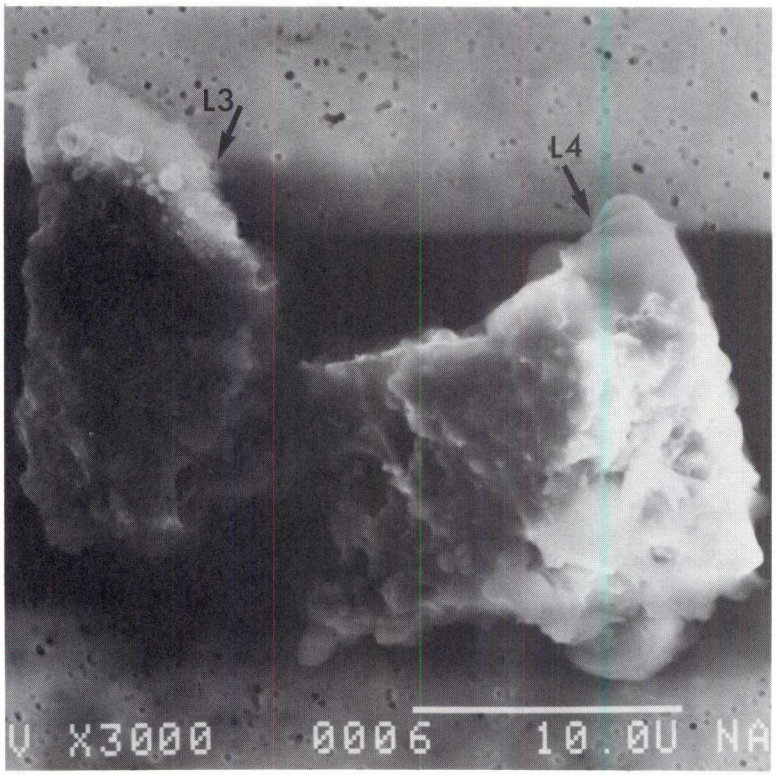
LUSTER: M

TYPE: C

COMMENTS:



L2011 L 4



S-92-35775

SIZE: 19x17

SHAPE: E

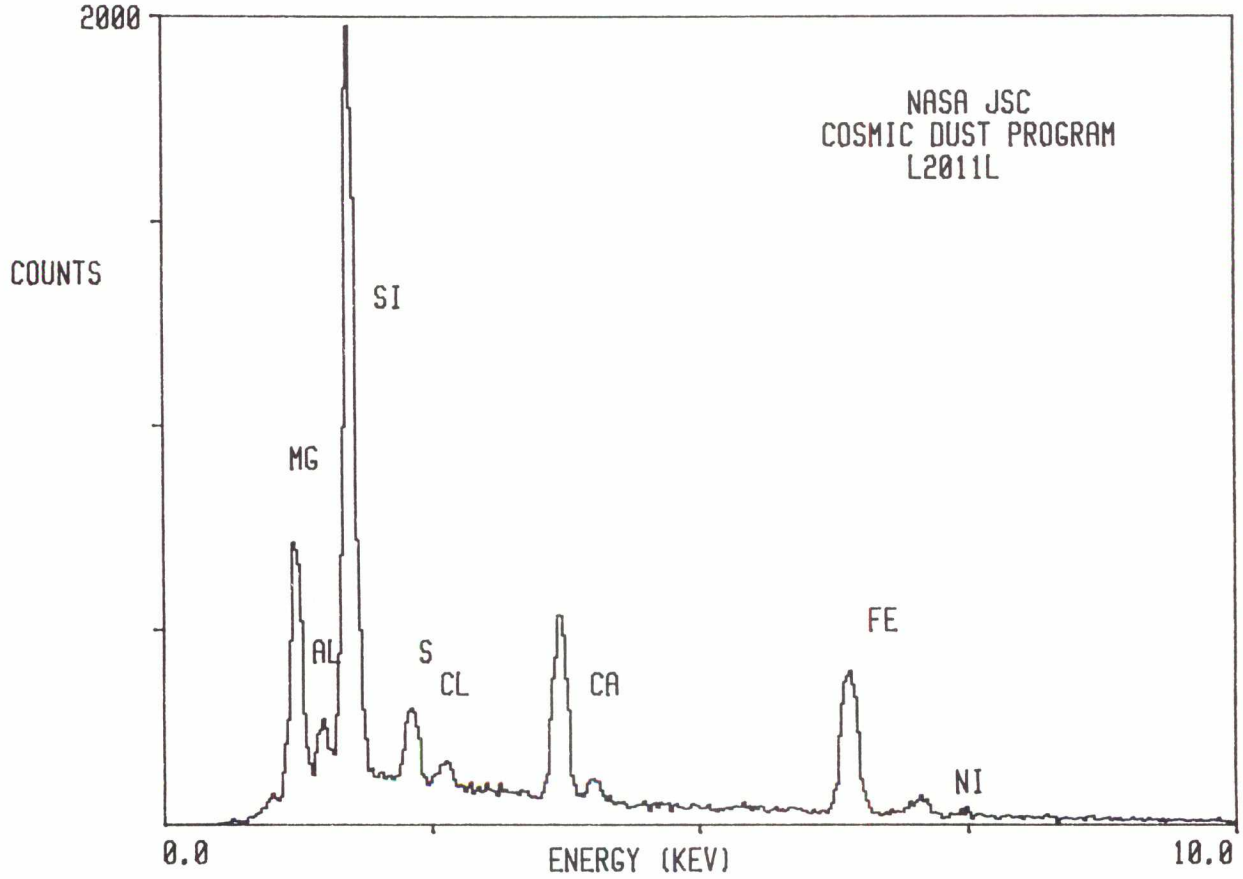
TRANS.: O

COLOR: Black

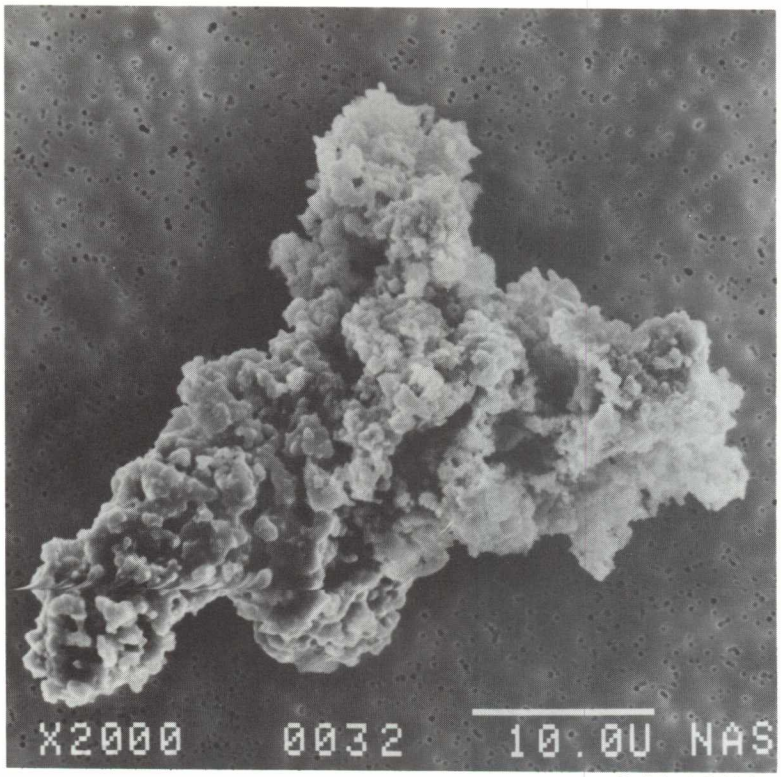
LUSTER: D

TYPE: C?

COMMENTS:
Attached to L2011 L3?



L2011 M 5



S-92-35402

SIZE: 44x25

SHAPE: I

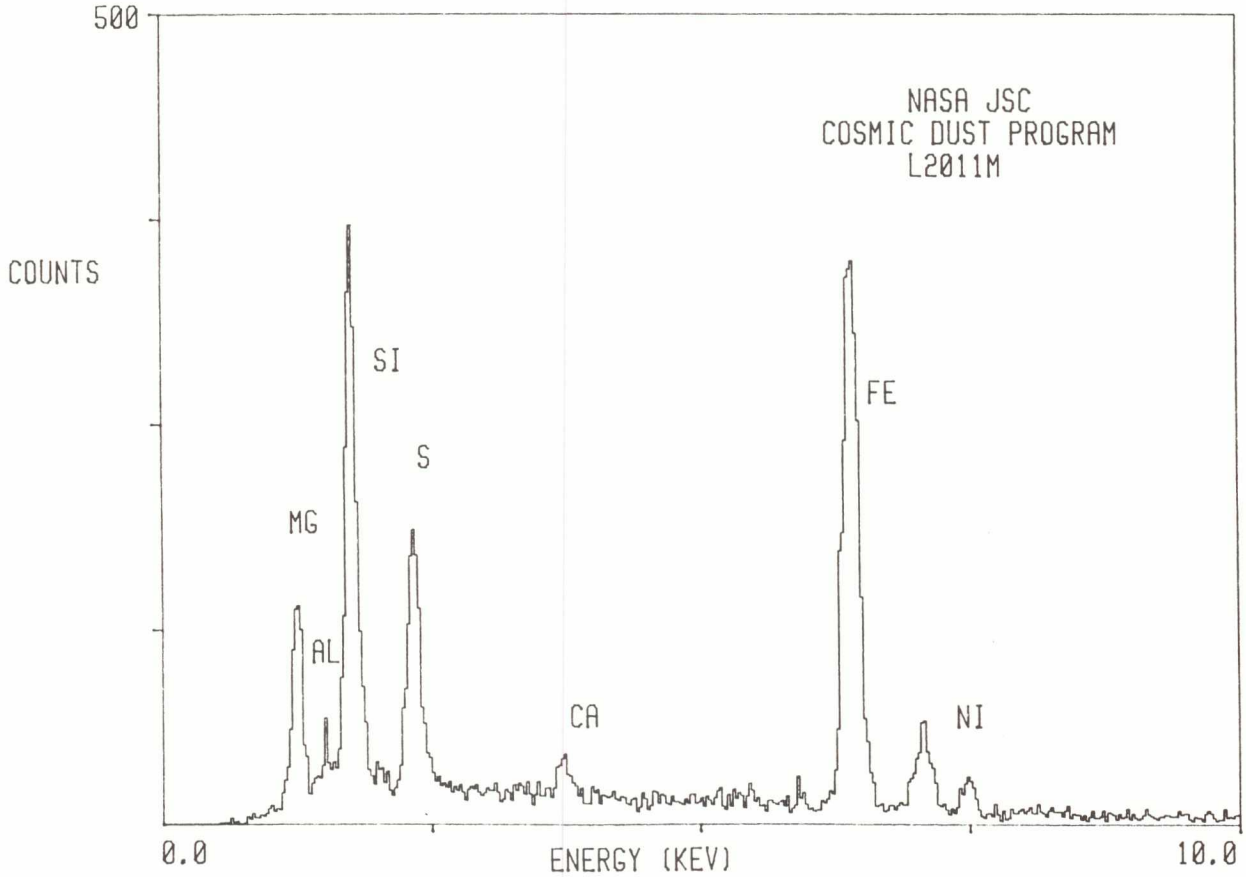
TRANS.: O

COLOR: Brown to Black

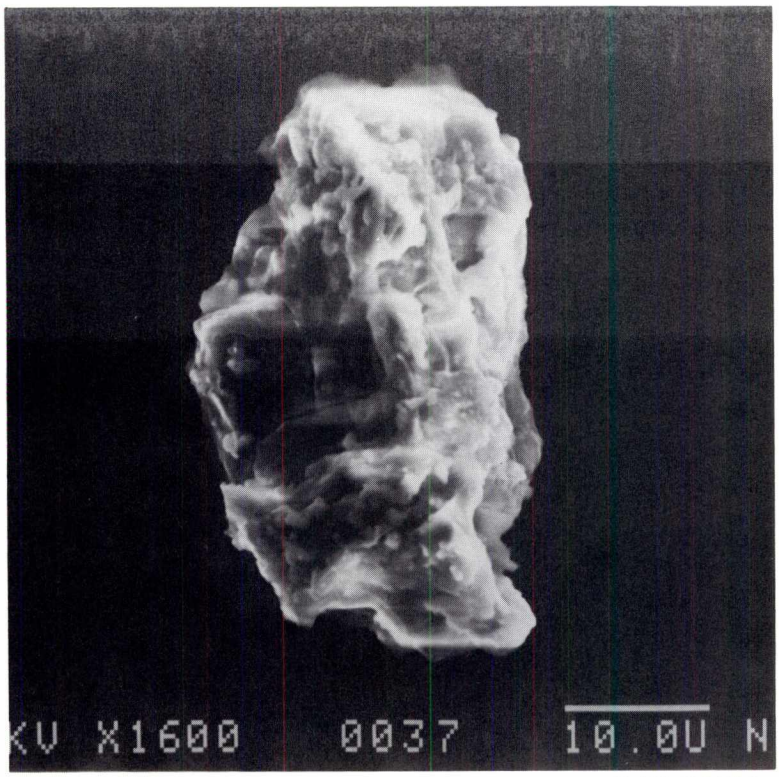
LUSTER: M

TYPE: C

COMMENTS:



L2011 M 8



S-92-35405

SIZE: 44x28

SHAPE: I

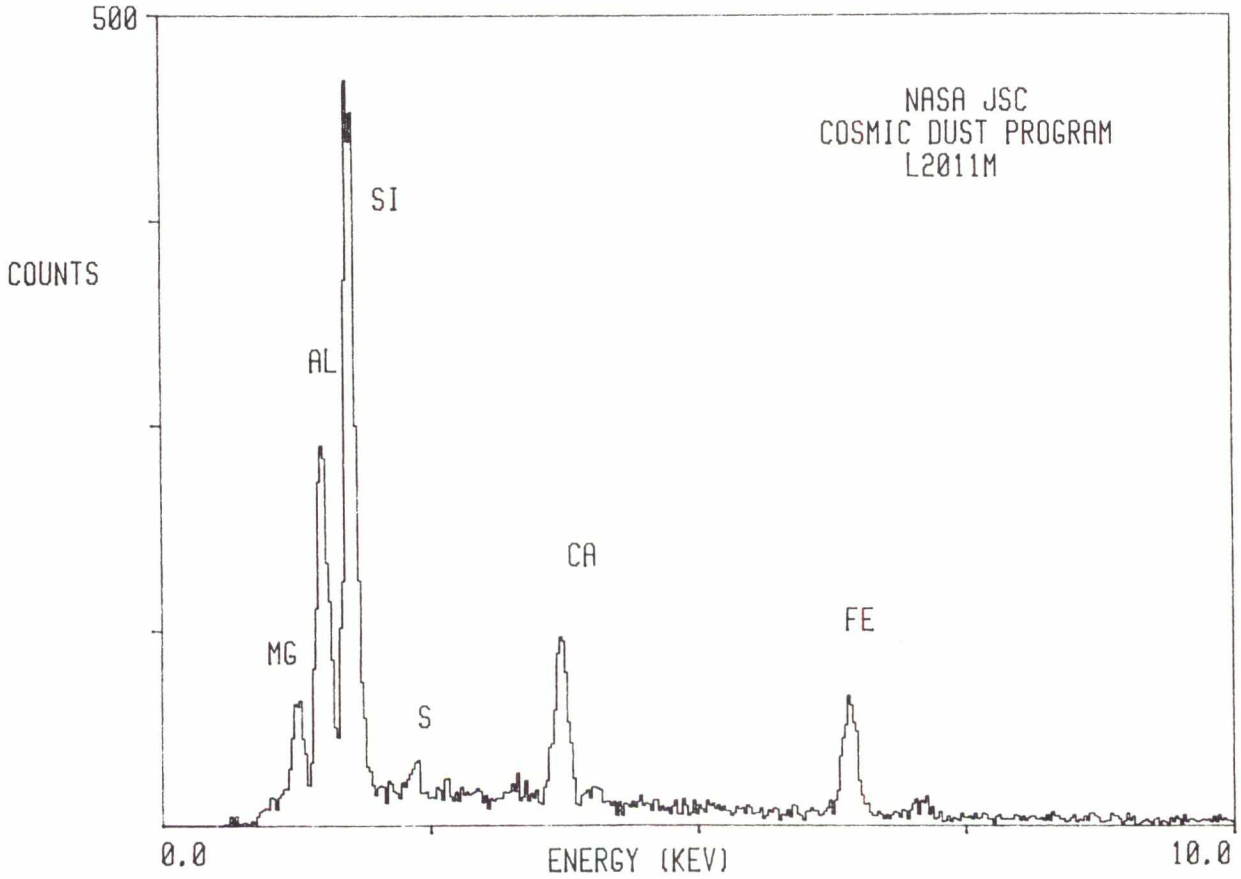
TRANS.: O

COLOR: Brown to Black

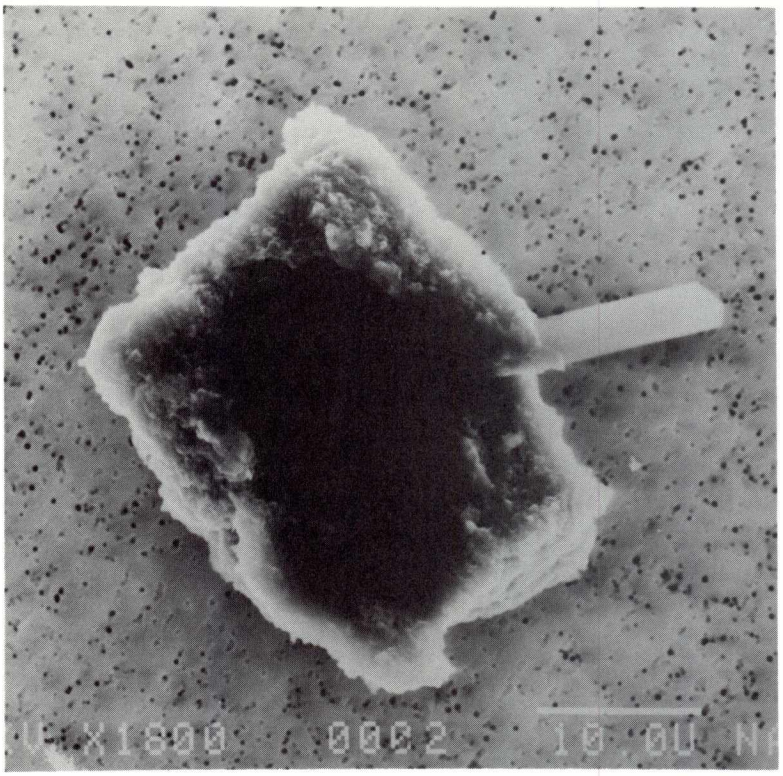
LUSTER: M

TYPE: C?

COMMENTS:



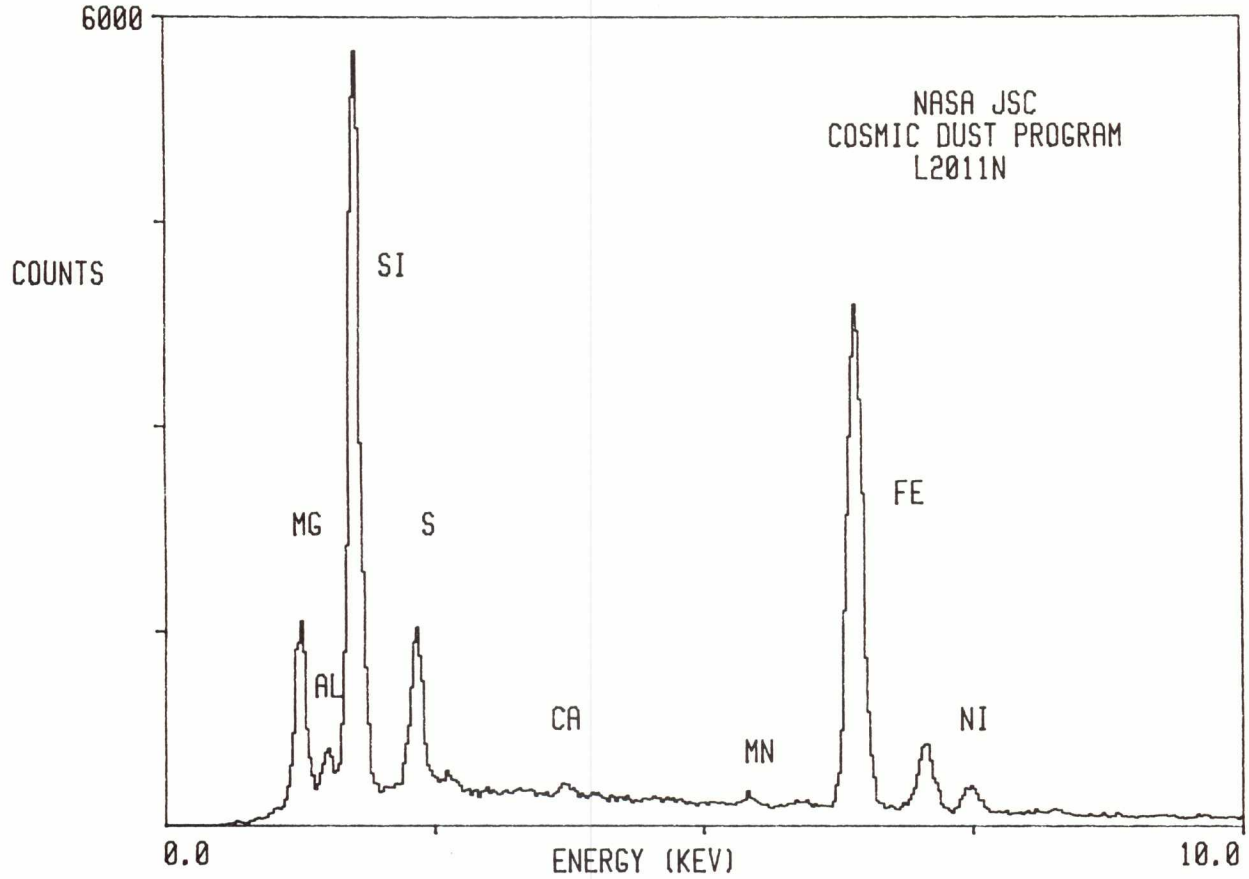
L2011 N 1



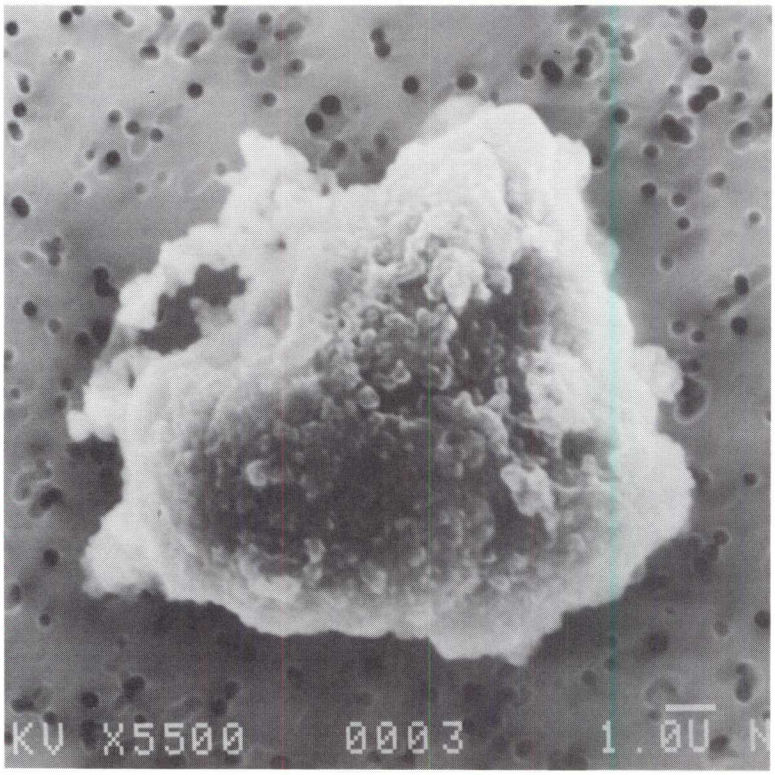
S-92-35348

SIZE: 30x26
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



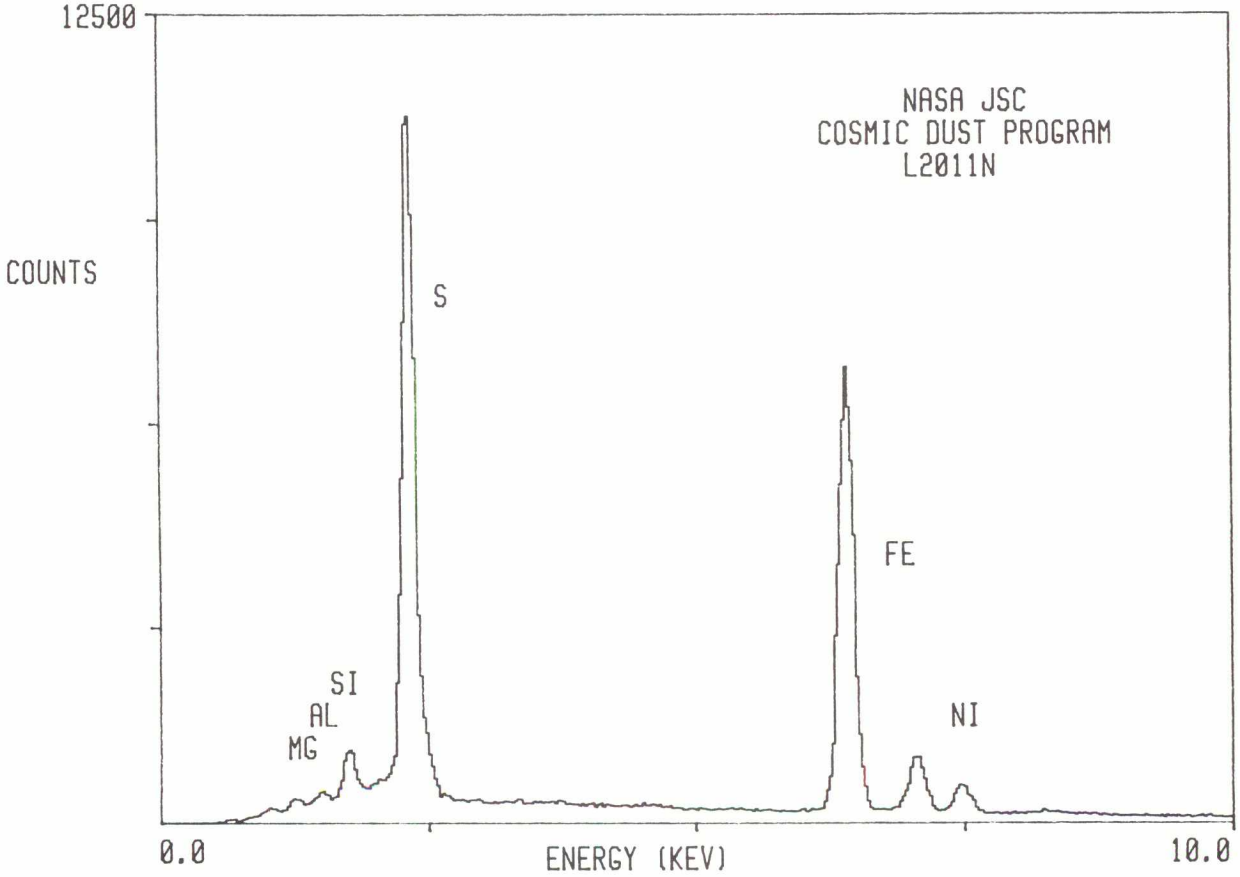
L2011 N 2



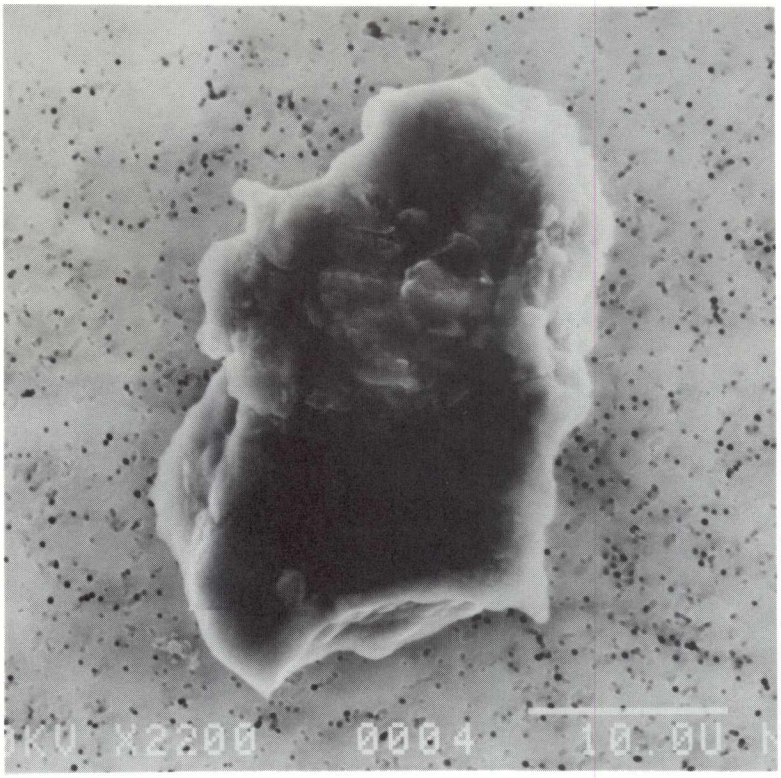
S-92-35349

SIZE: 13x11
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



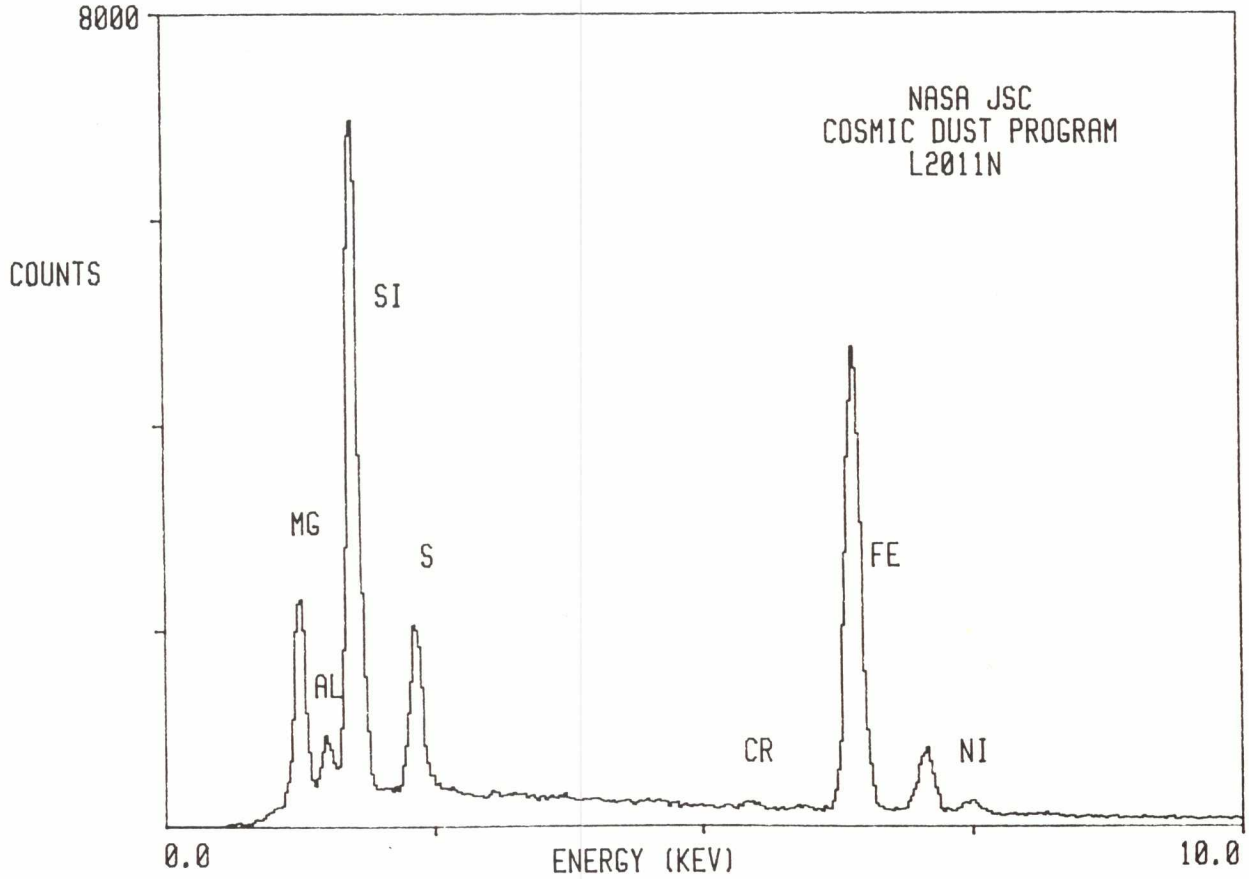
L2011 N 3



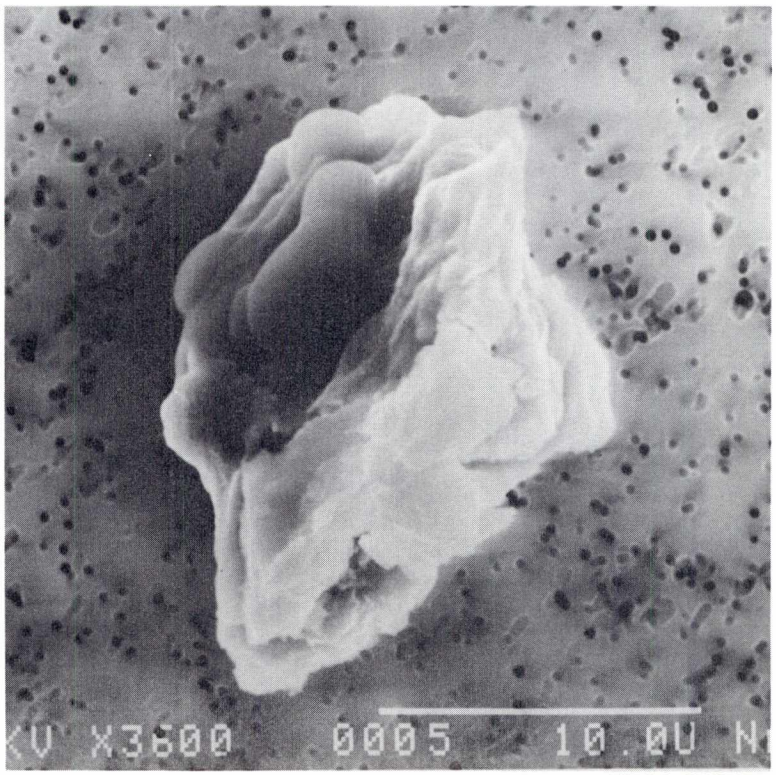
S-92-35350

SIZE: 35x22
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



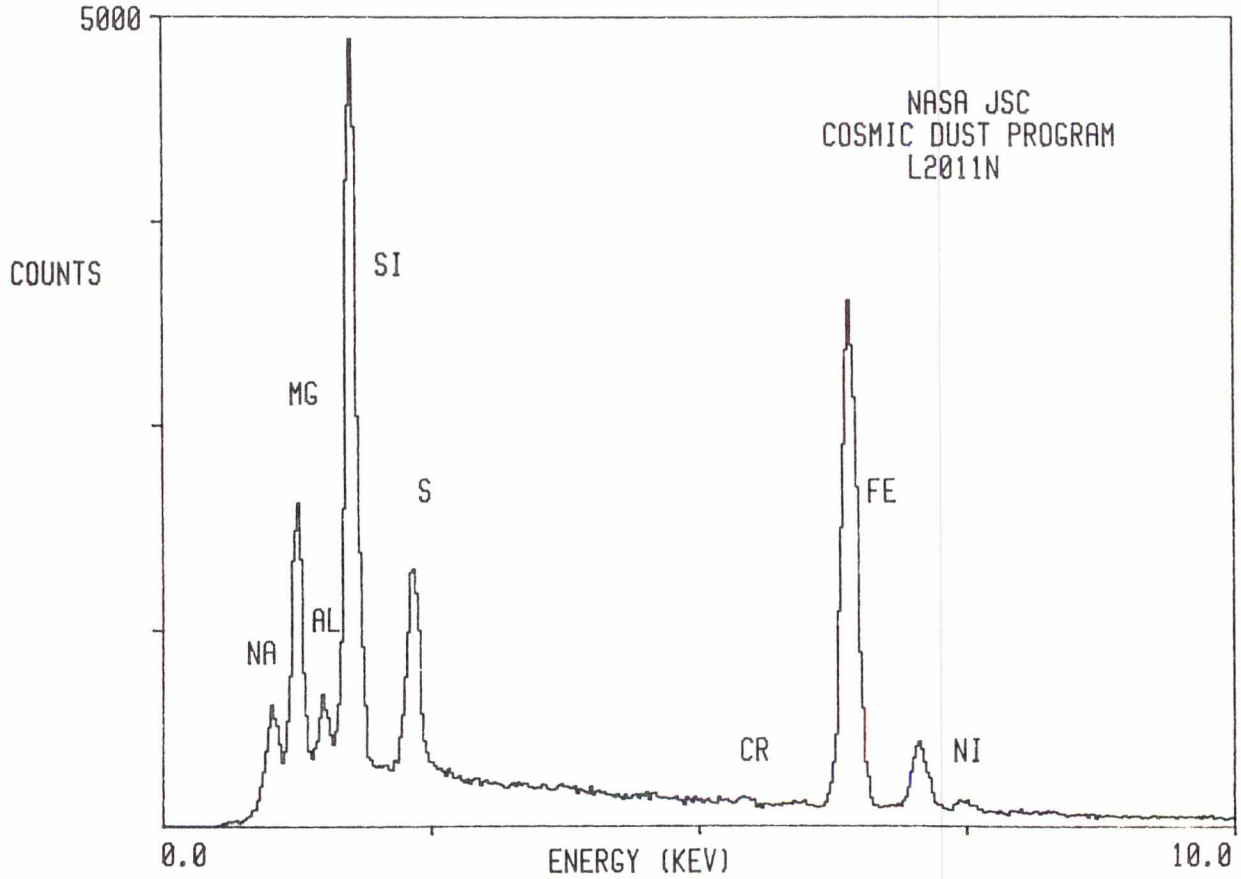
L2011 N 4



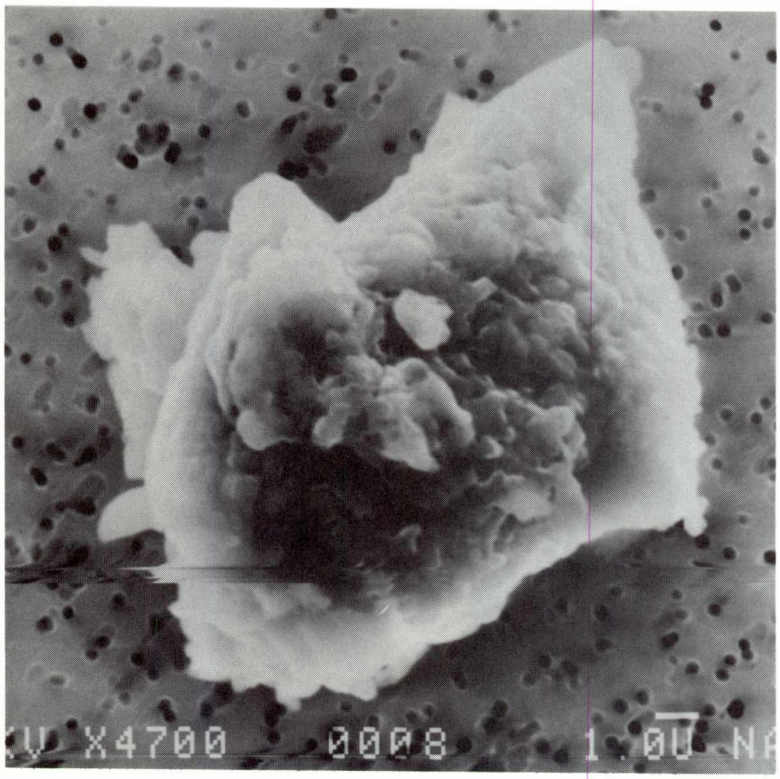
S-92-35351

SIZE: 22x19
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



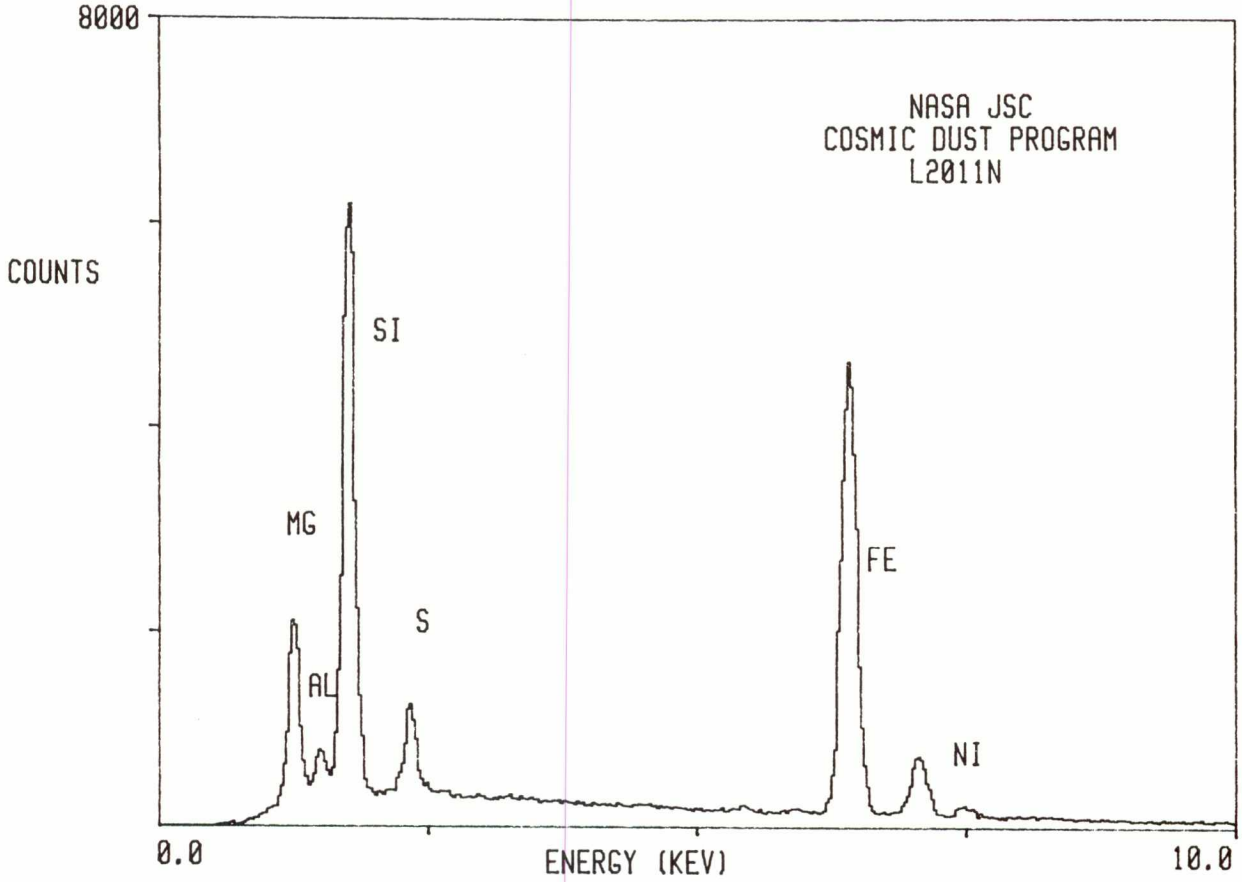
L2011 N 6



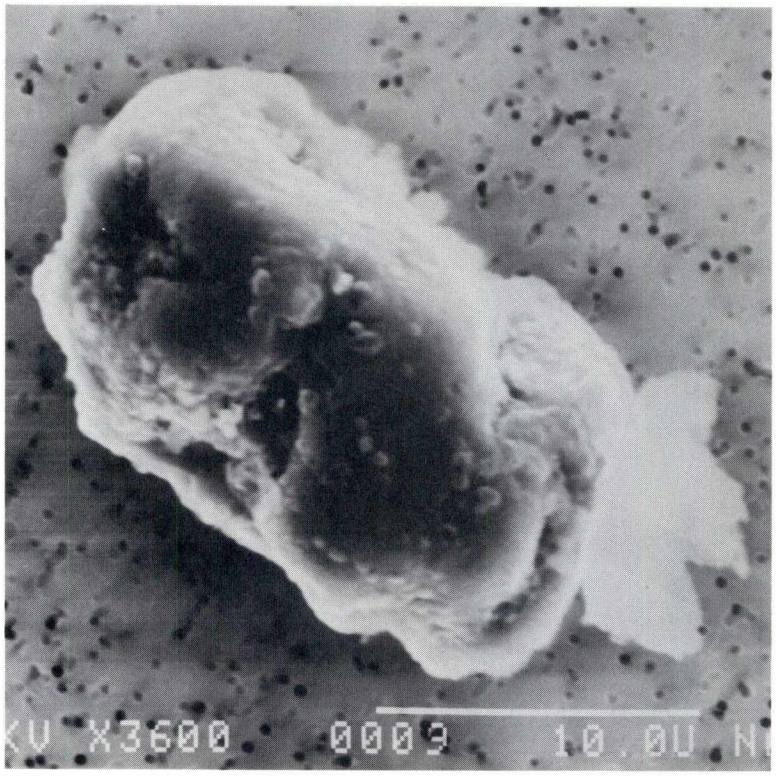
S-92-35353

SIZE: 15x13
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



L2011 N 7



S-92-35354

SIZE: 25x13

SHAPE: I

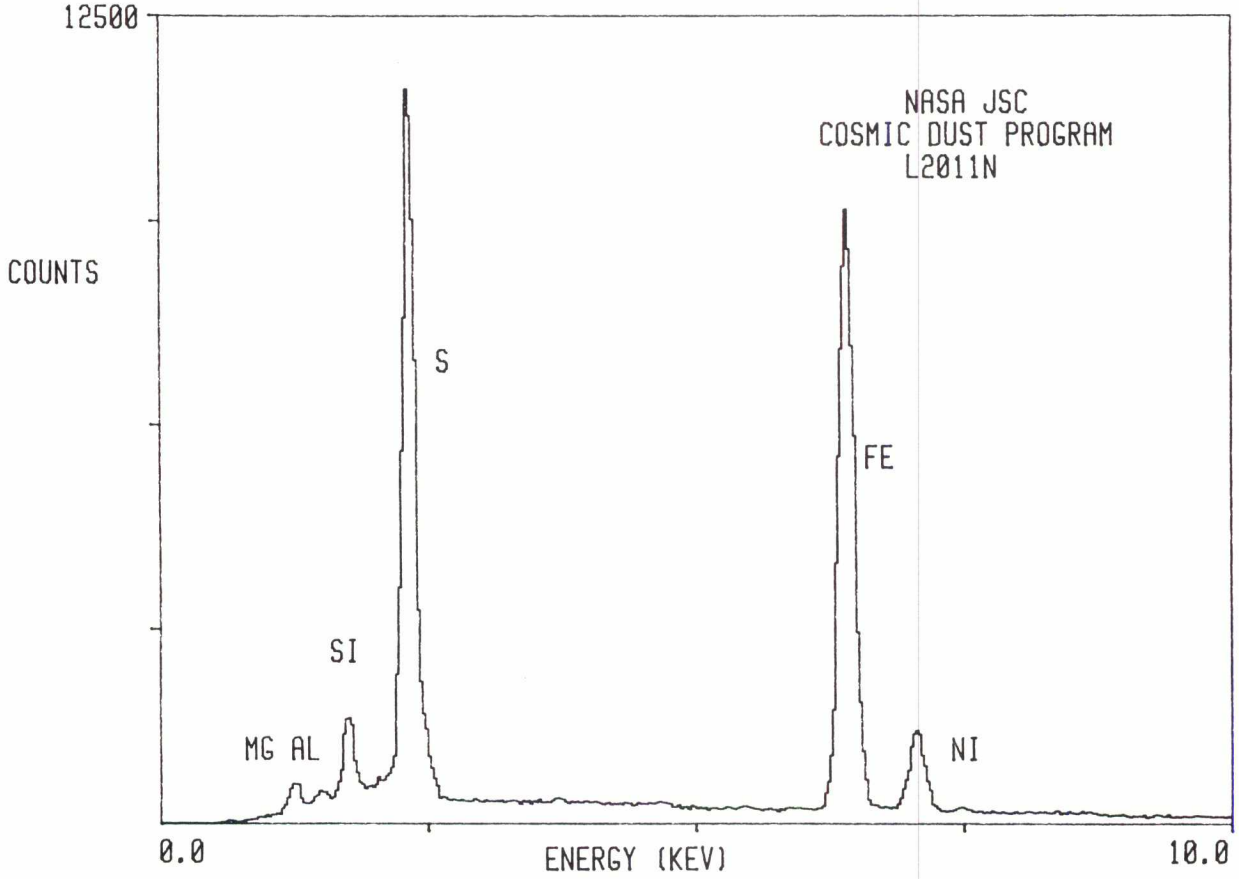
TRANS.: O

COLOR: Green to Red to Black

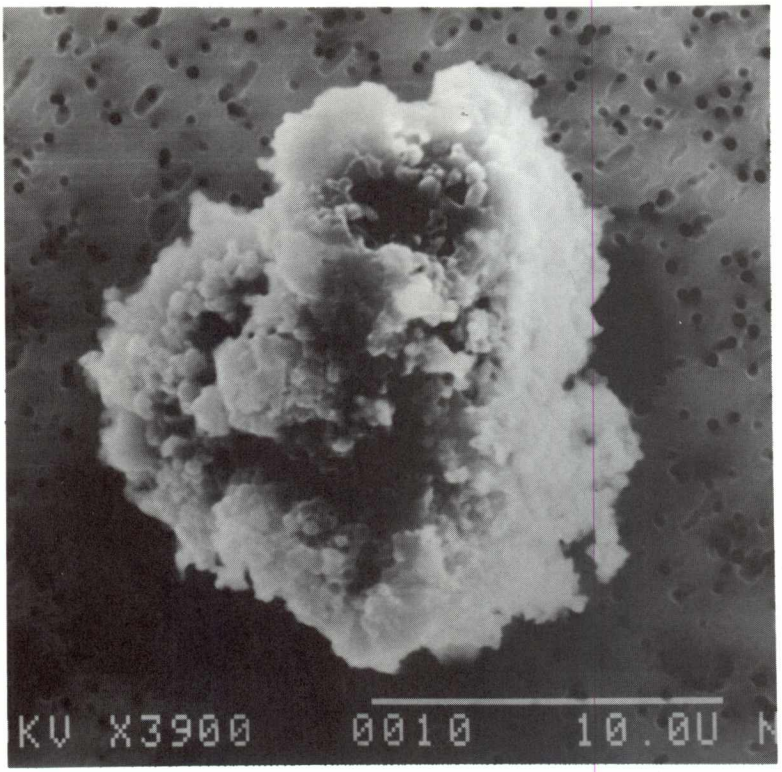
LUSTER: M

TYPE: C

COMMENTS:



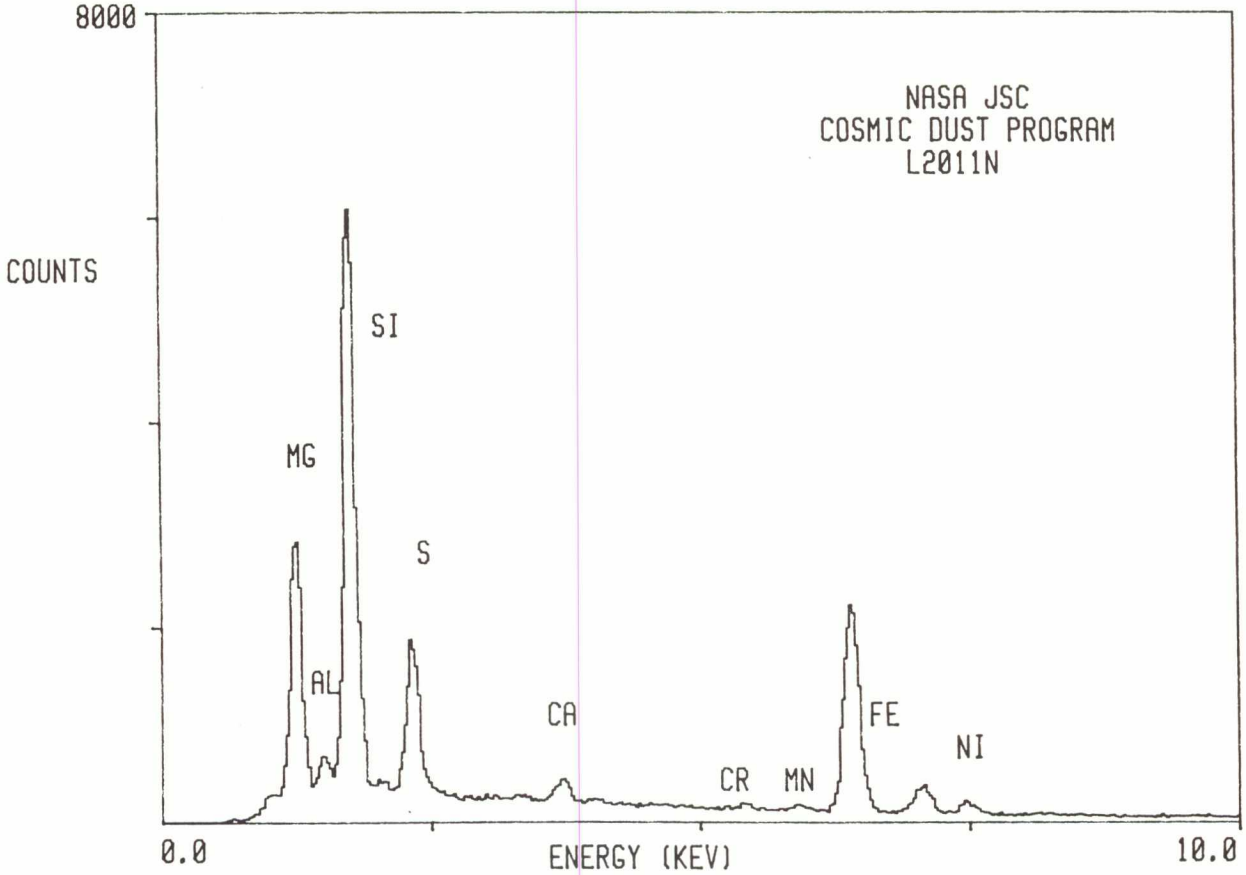
L2011 N 8



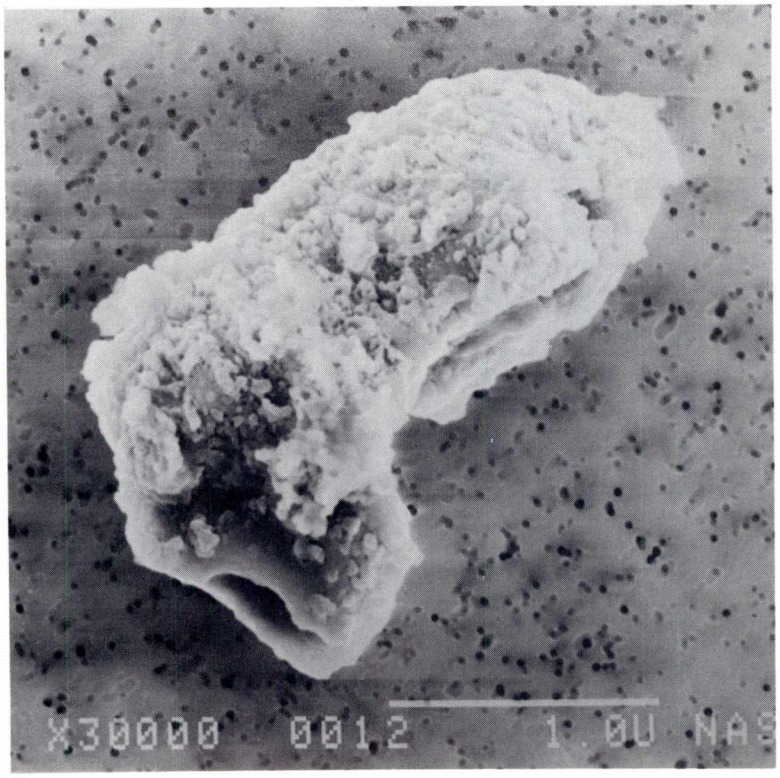
S-92-35355

SIZE: 17x15
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



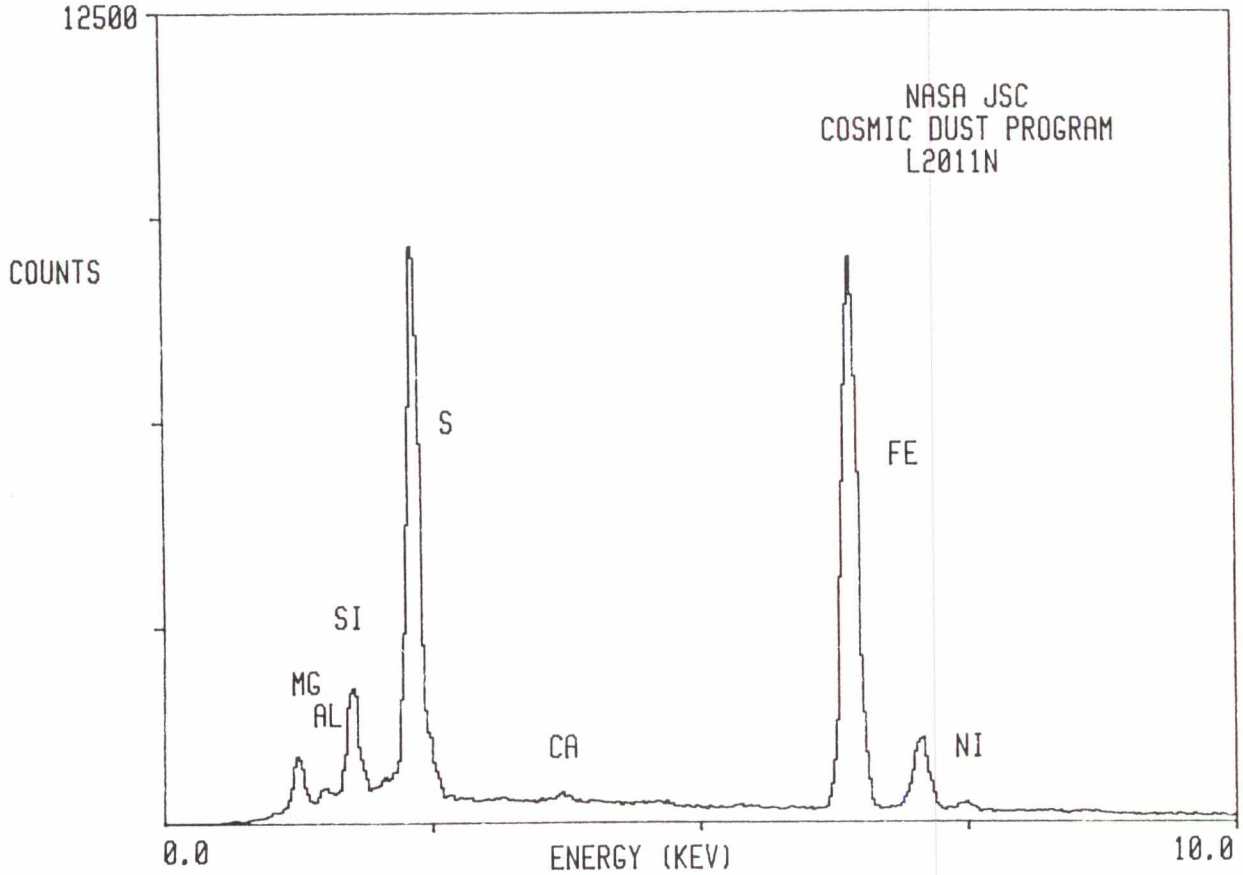
L2011 N 10



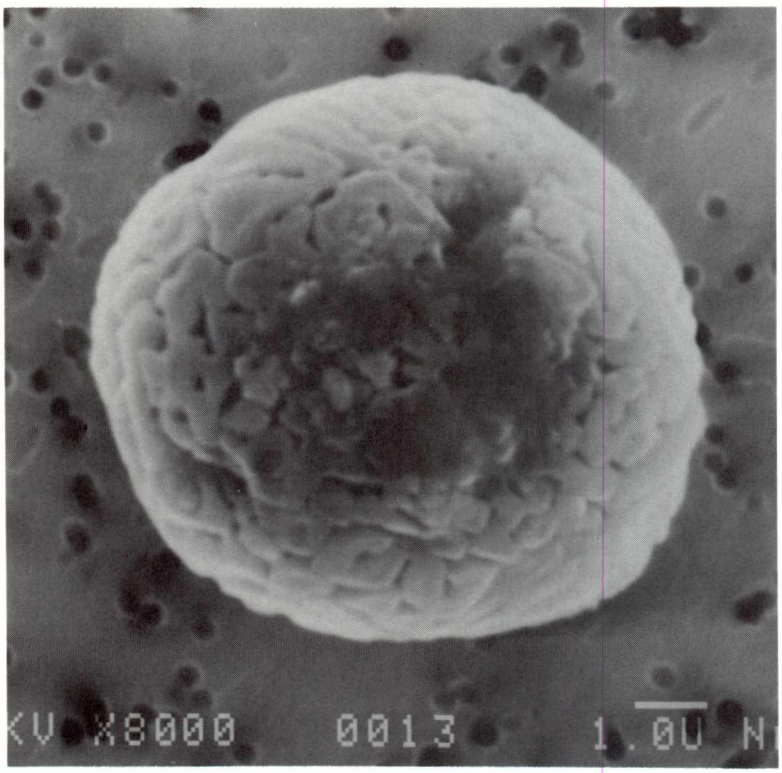
S-92-35357

SIZE: 27x15
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



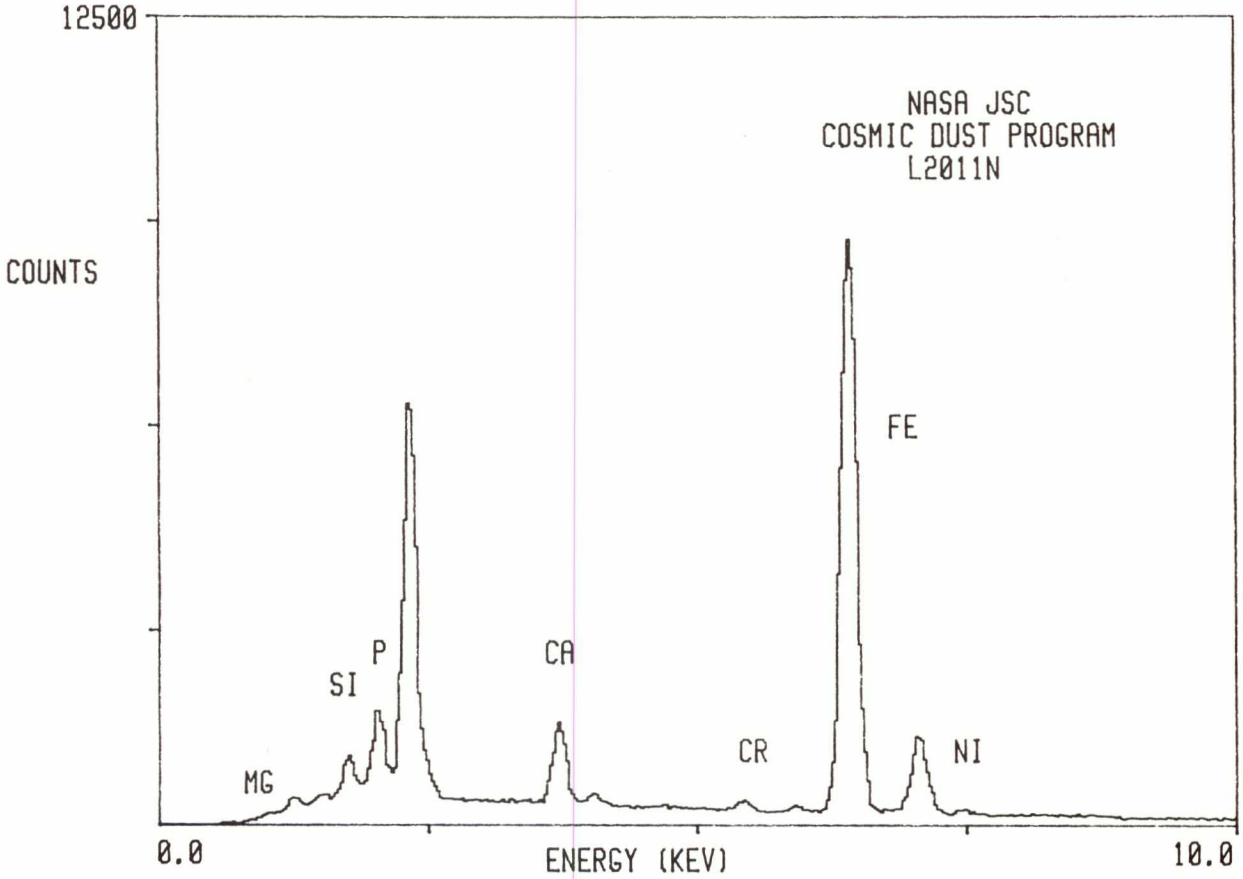
L2011 N 11



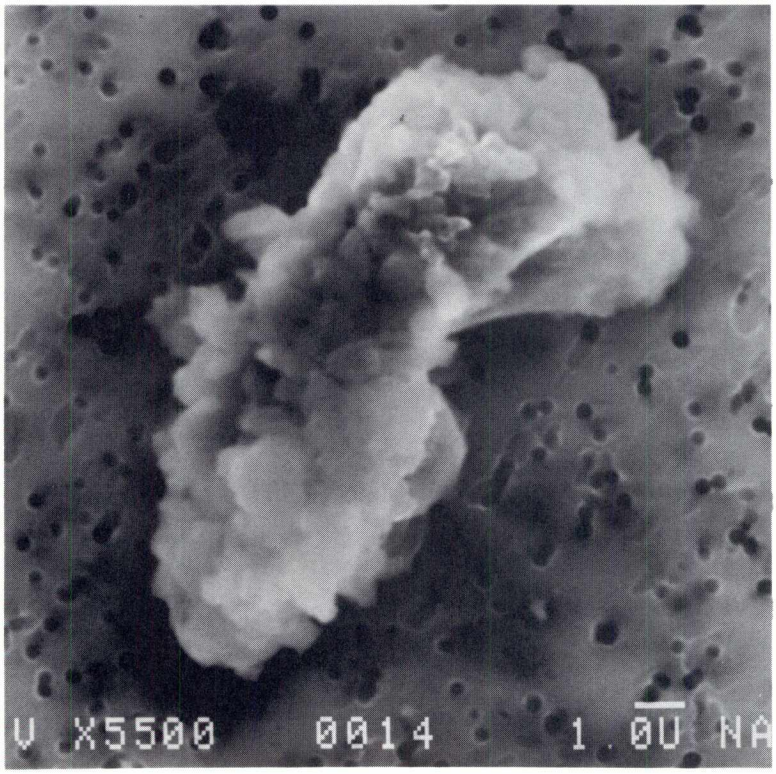
S-92-35358

SIZE: 9
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



L2011 N 12



S-92-35359

SIZE: 13x6

SHAPE: I

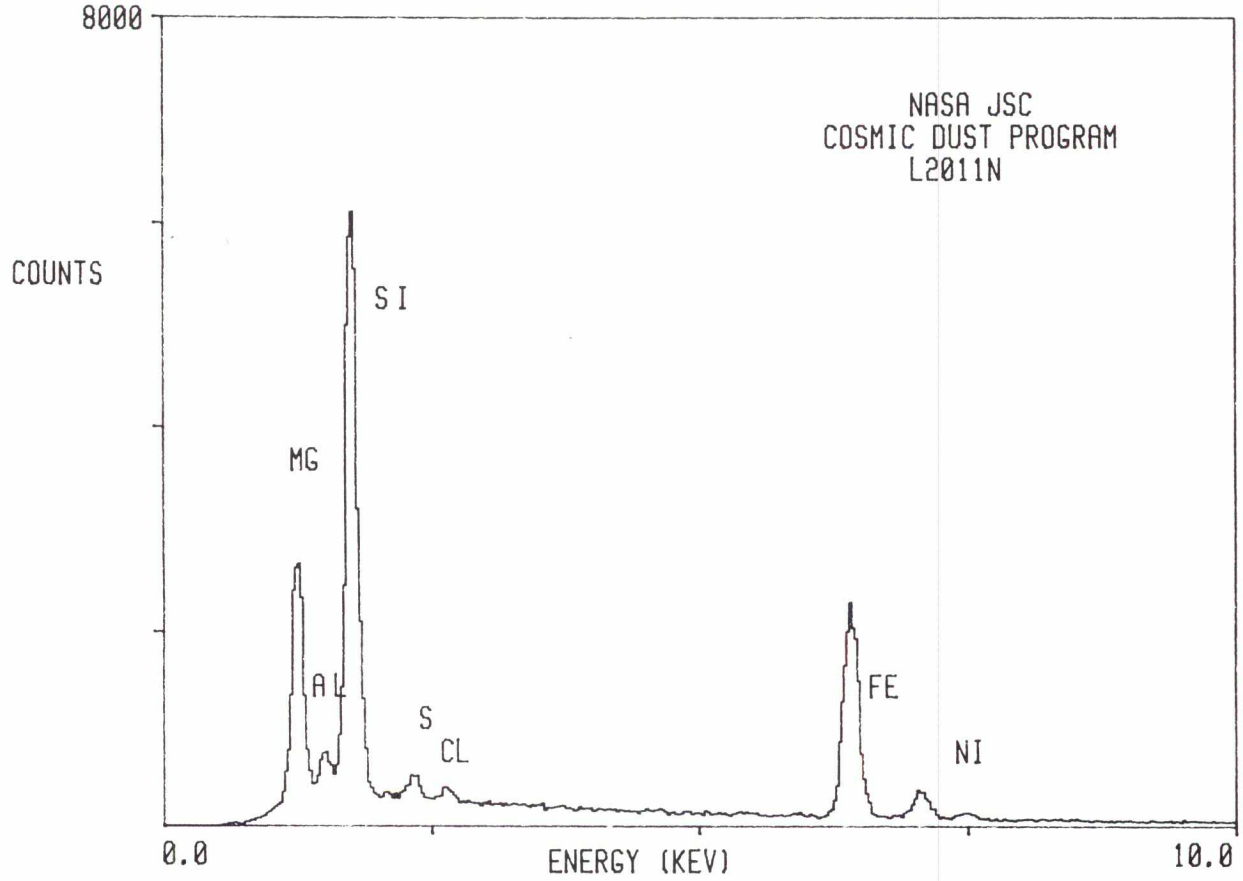
TRANS.: O

COLOR: Black

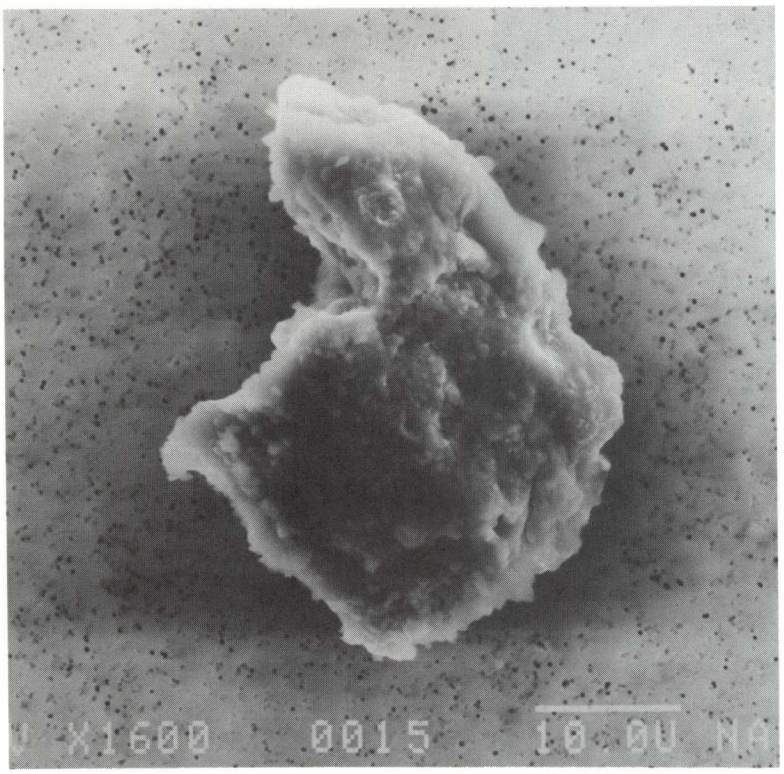
LUSTER: R

TYPE: C

COMMENTS:



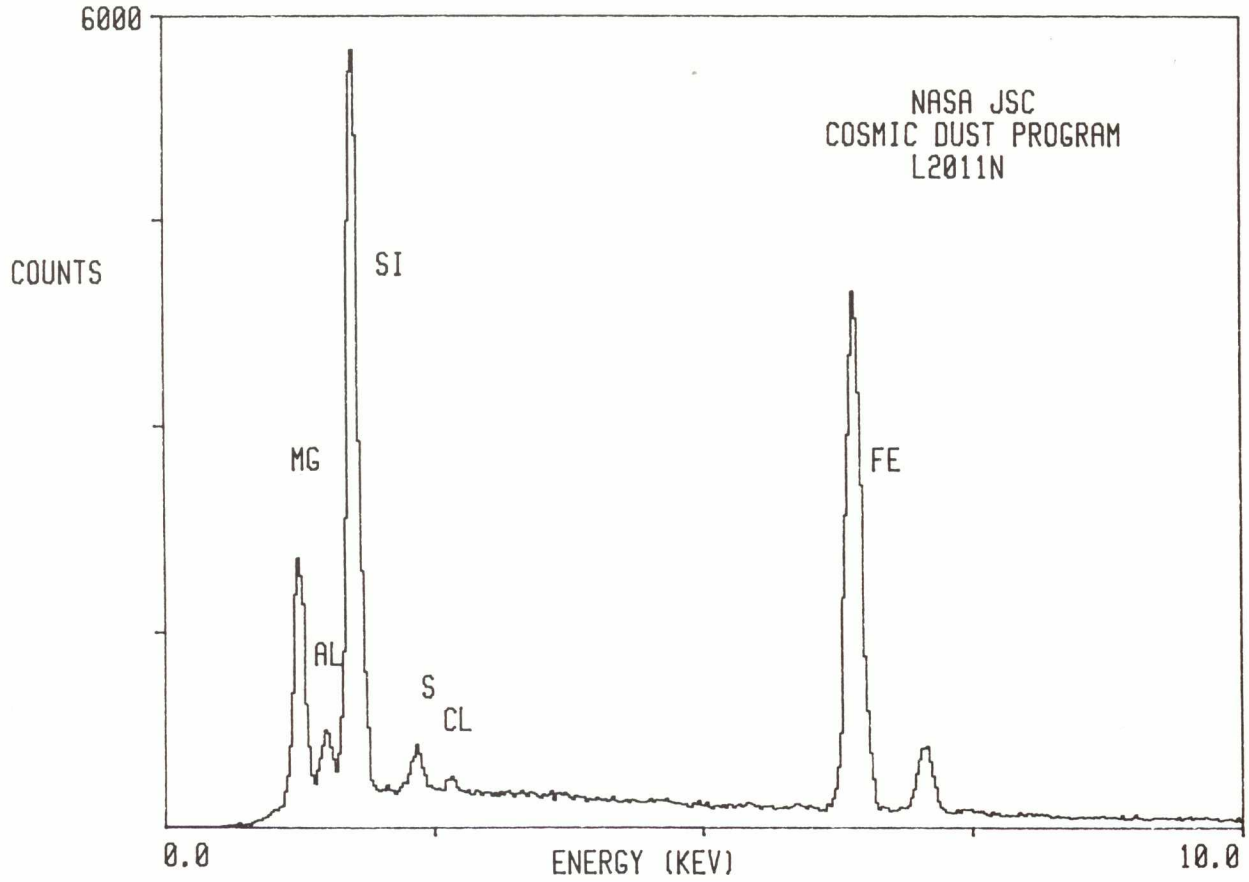
L2011 N 13



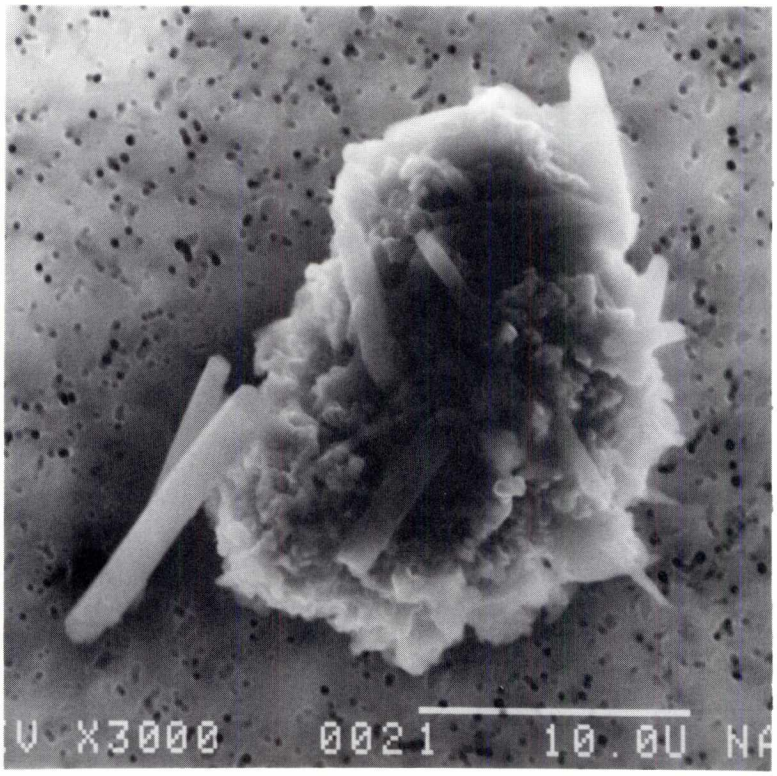
S-92-35360

SIZE: 42x33
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



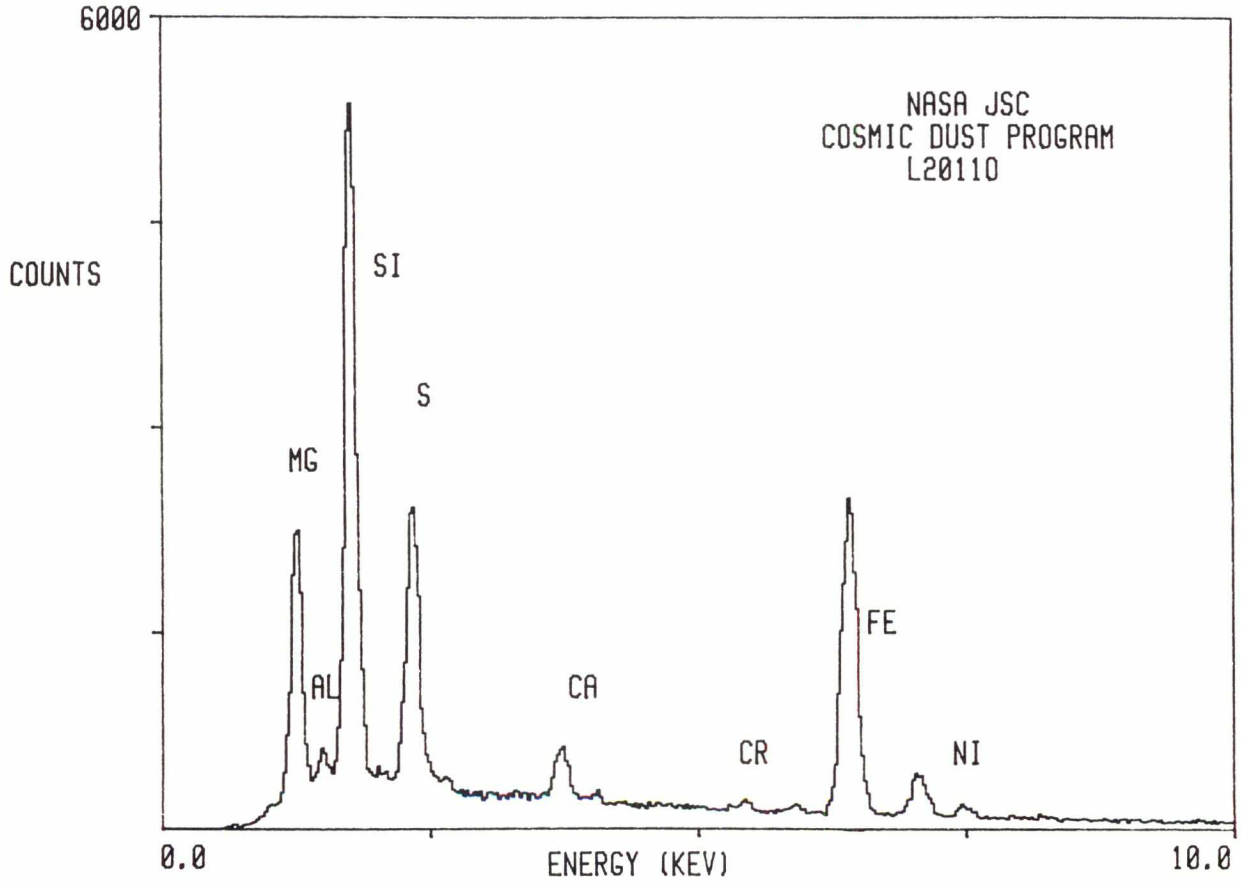
L2011 O 1



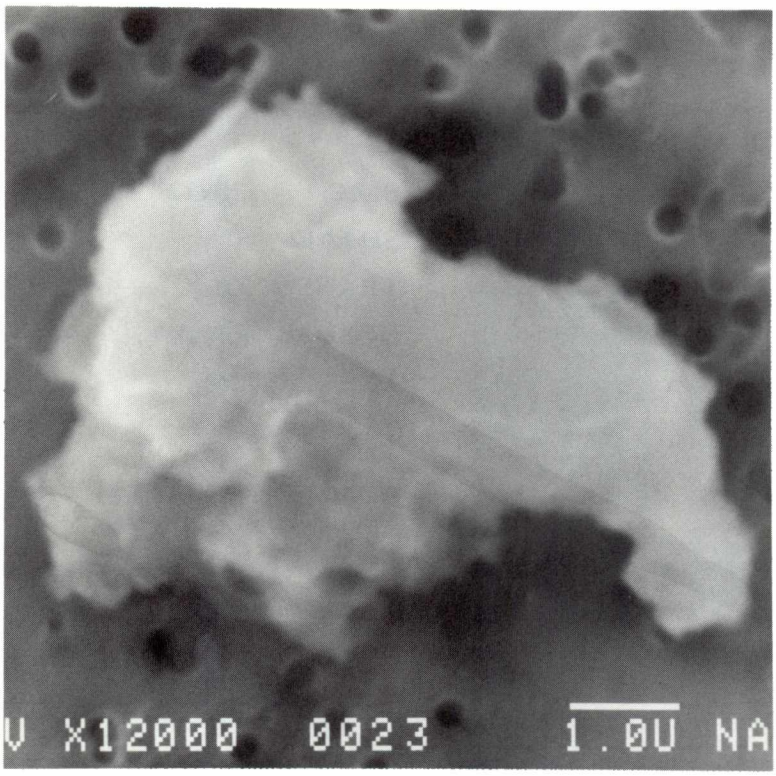
S-92-35342

SIZE: 22x13
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:

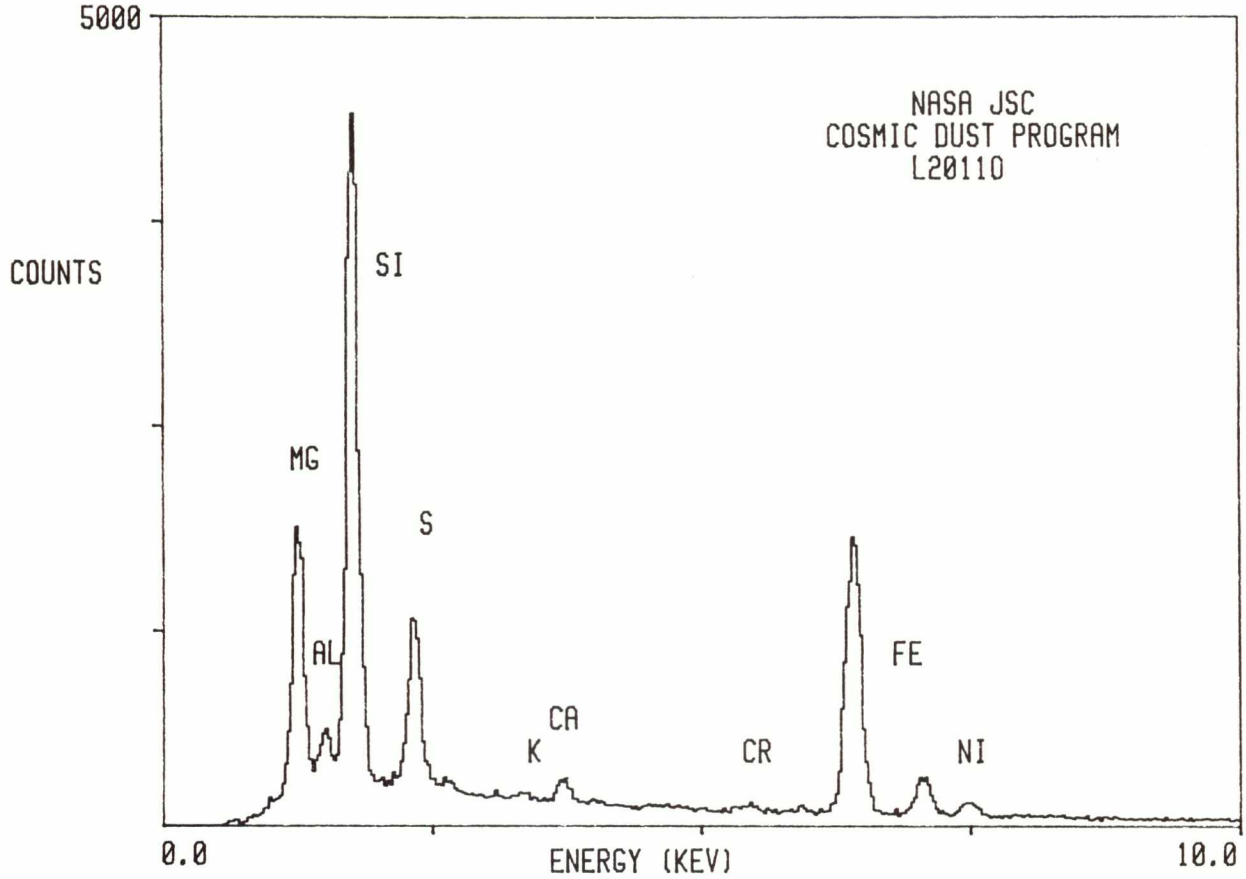


L2011 O 2

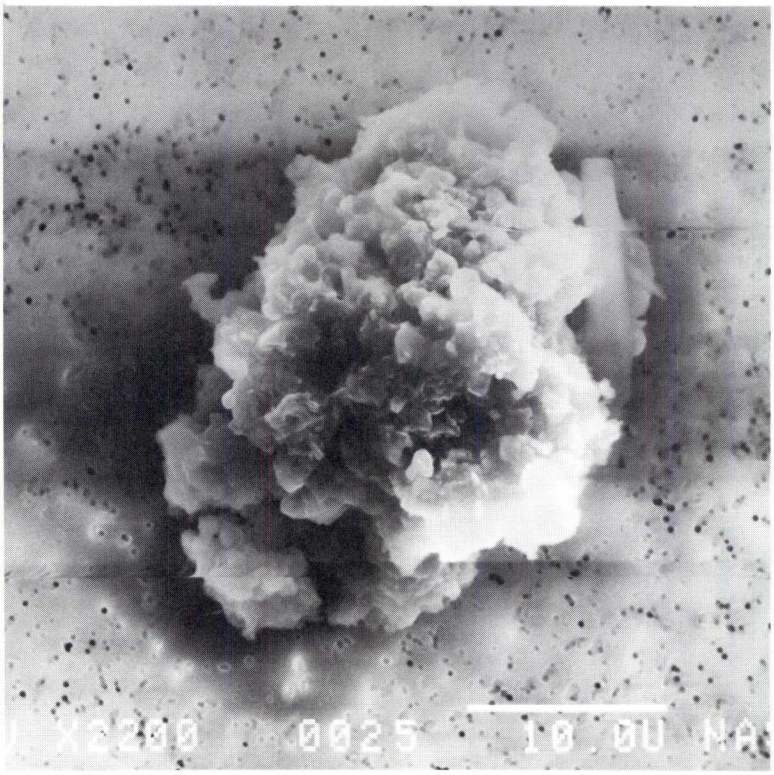


S-92-35343

SIZE: 5
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C
COMMENTS:



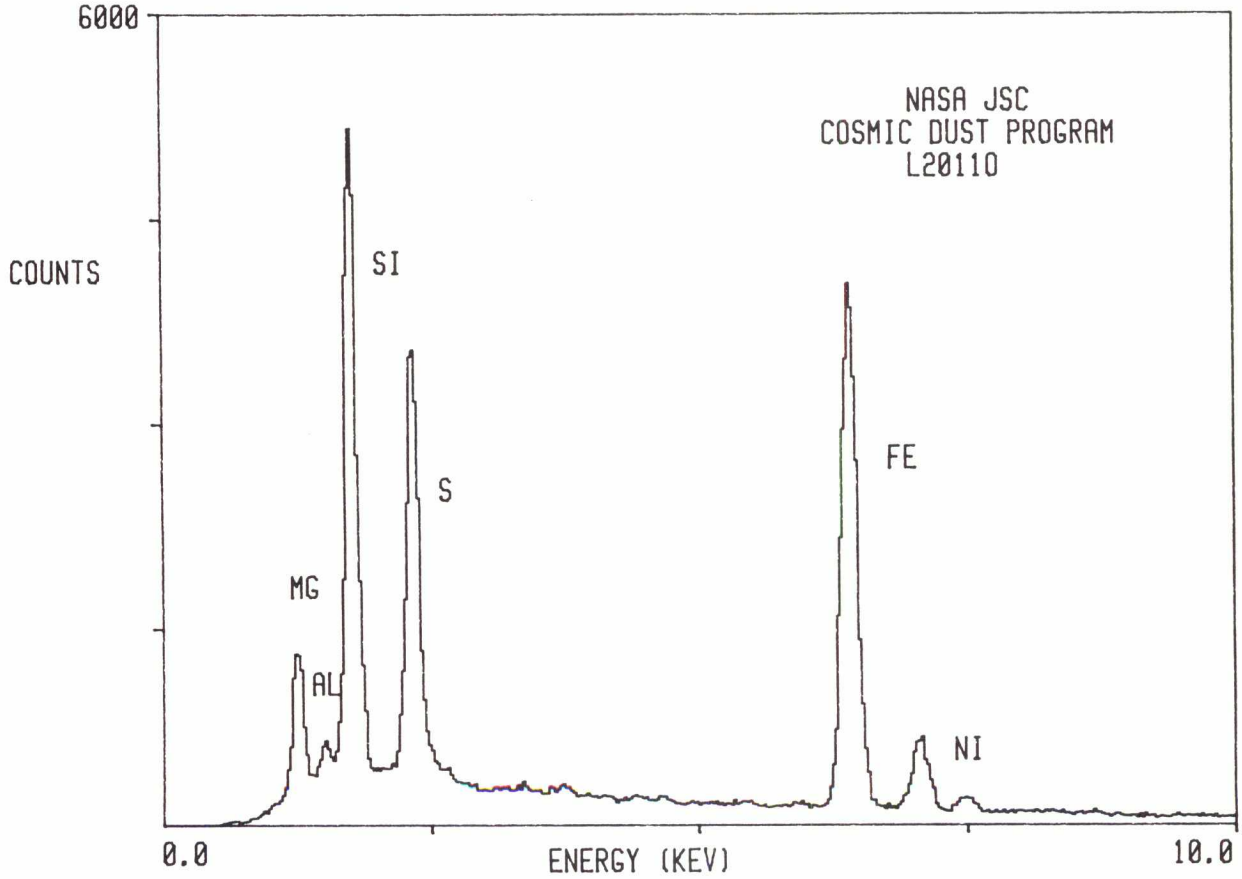
L2011 O 3



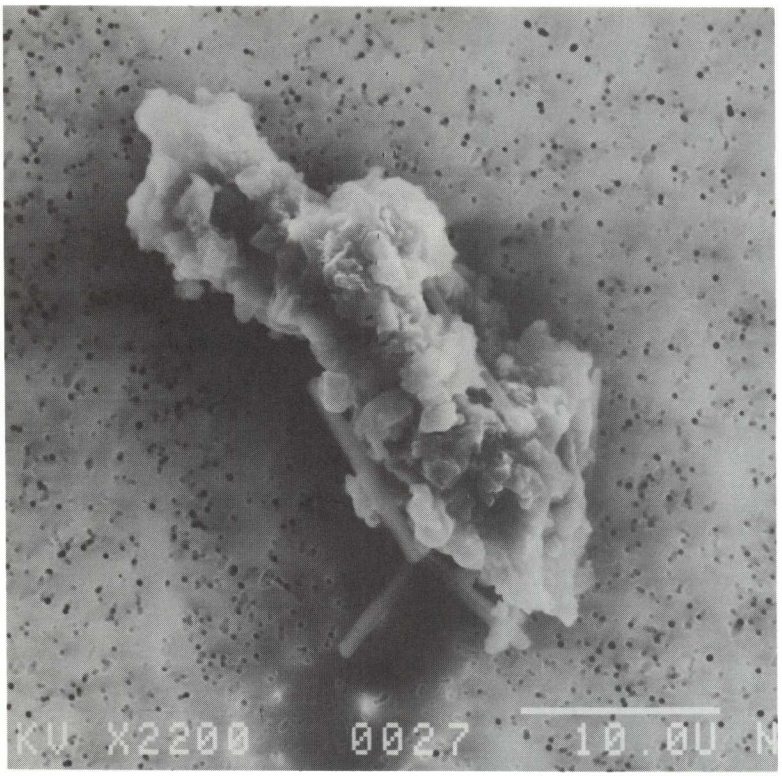
S-92-35344

SIZE: 28x22
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: SM
TYPE: C

COMMENTS:



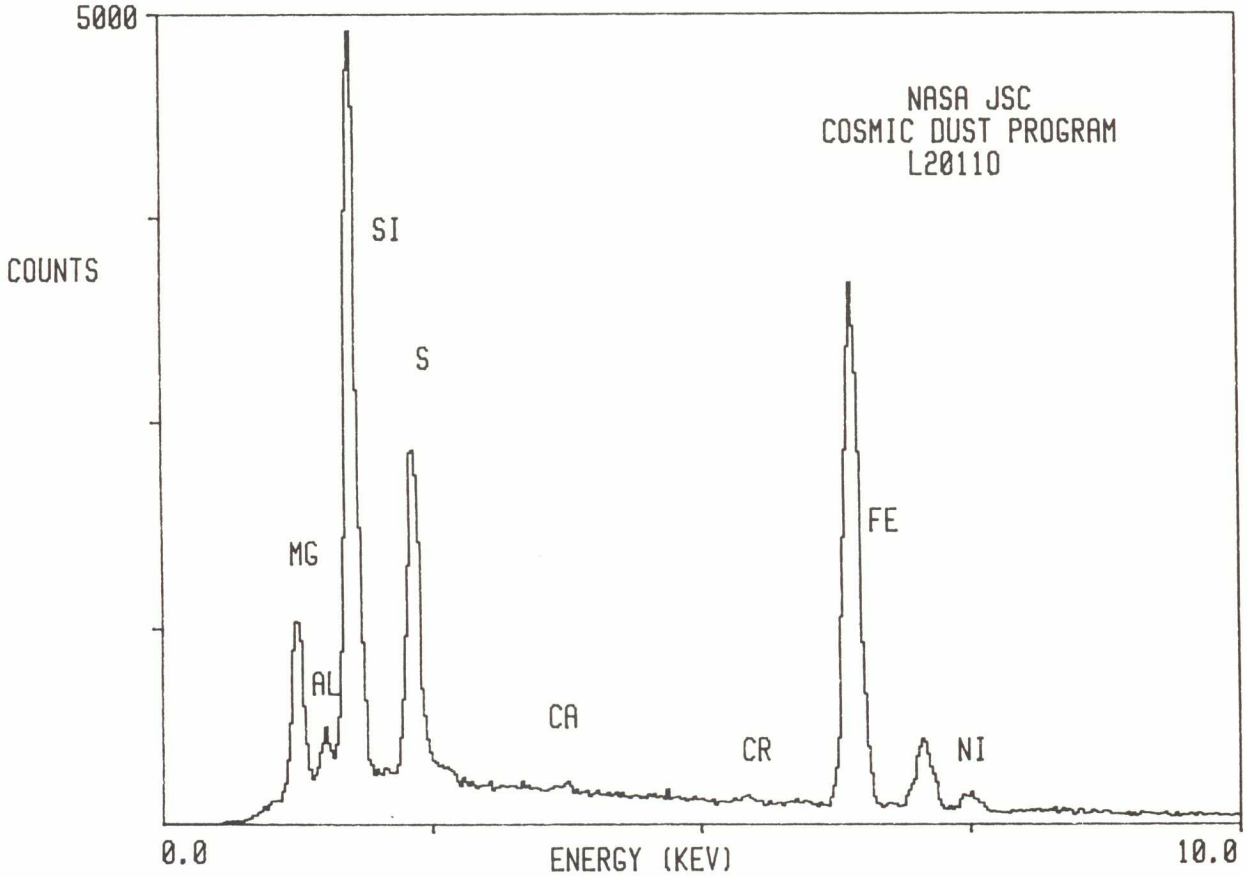
L2011 O 4



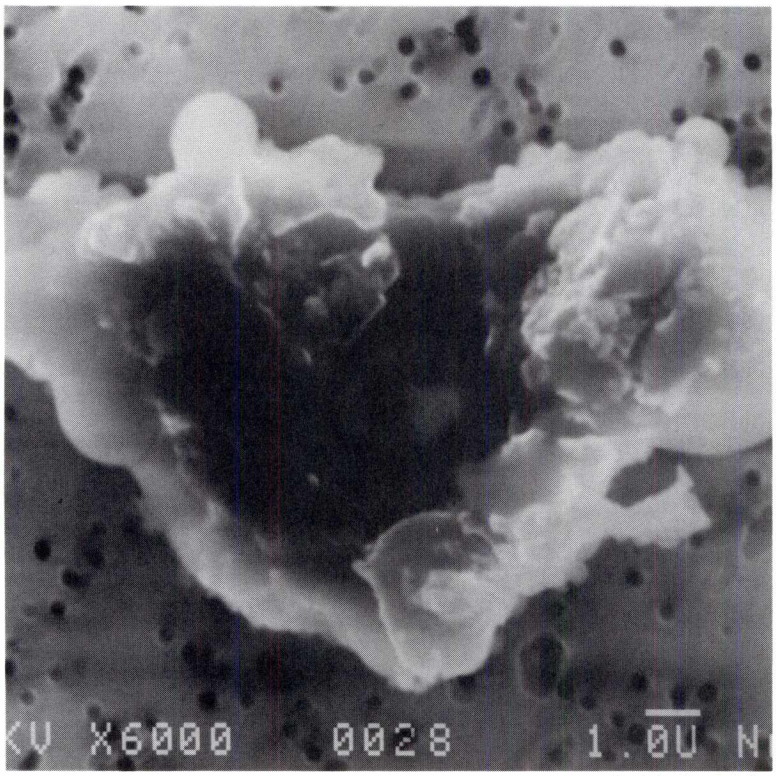
S-92-35345

SIZE: 35x14
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



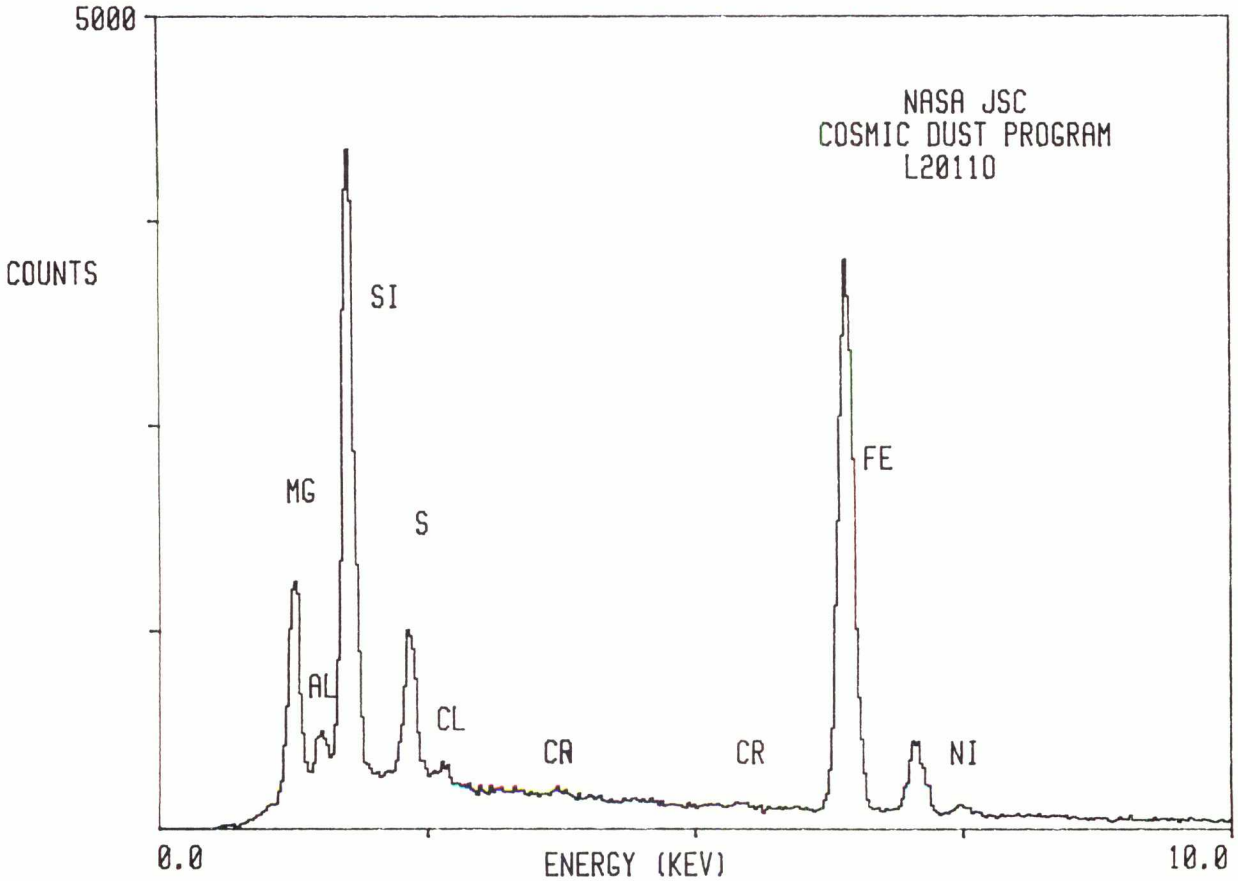
L2011 O 5



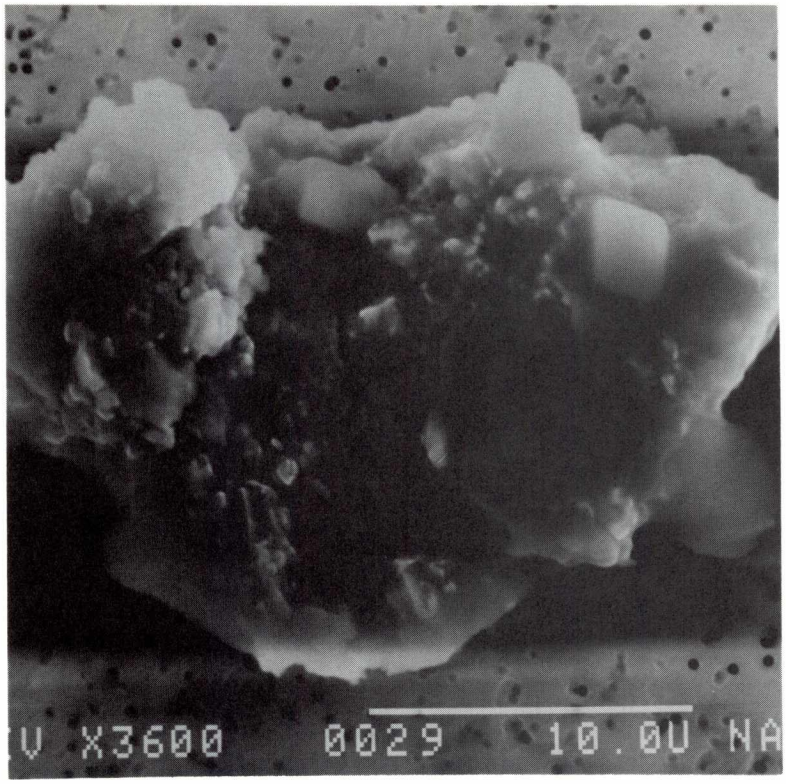
S-92-35346

SIZE: 17x9
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



L2011 O 6



S-92-35347

SIZE: 25x15

SHAPE: I

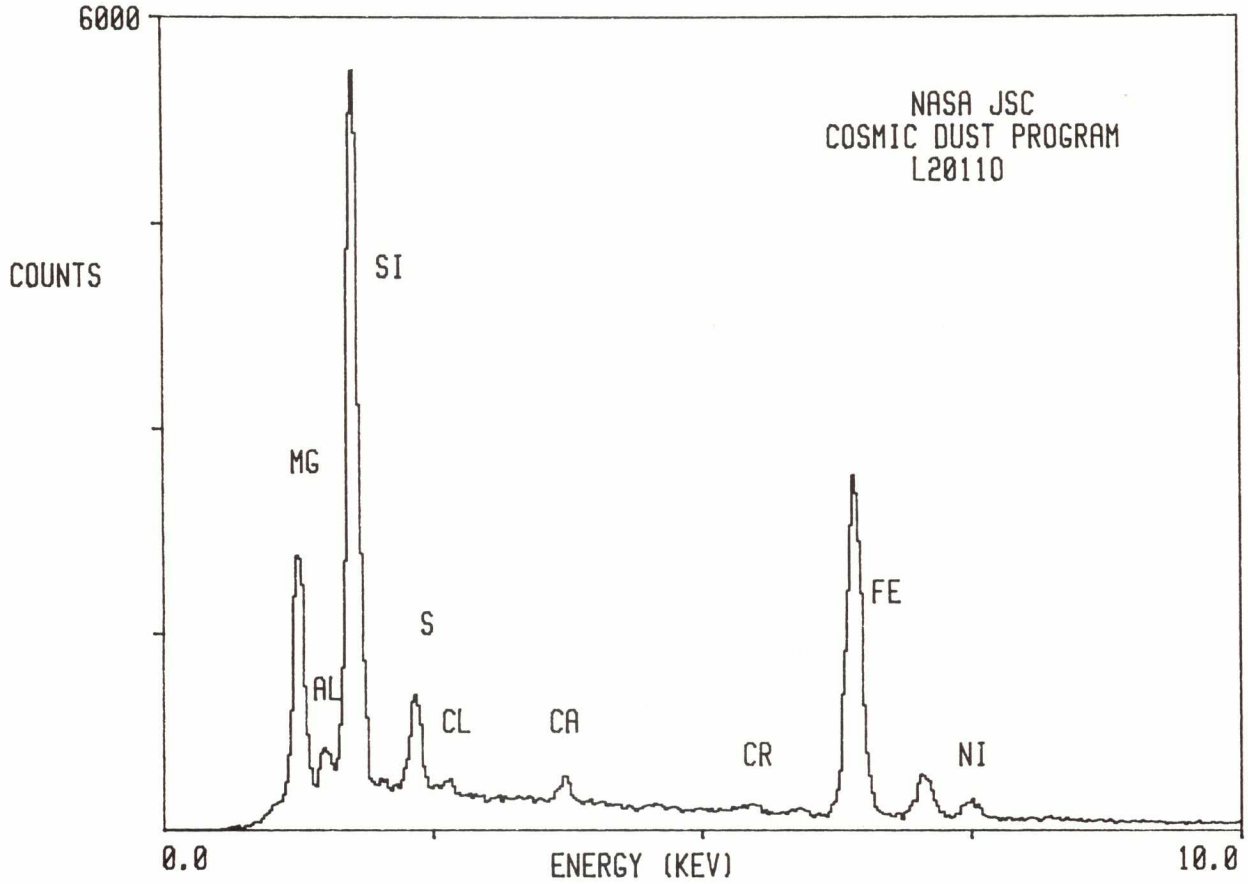
TRANS.: O

COLOR: Black

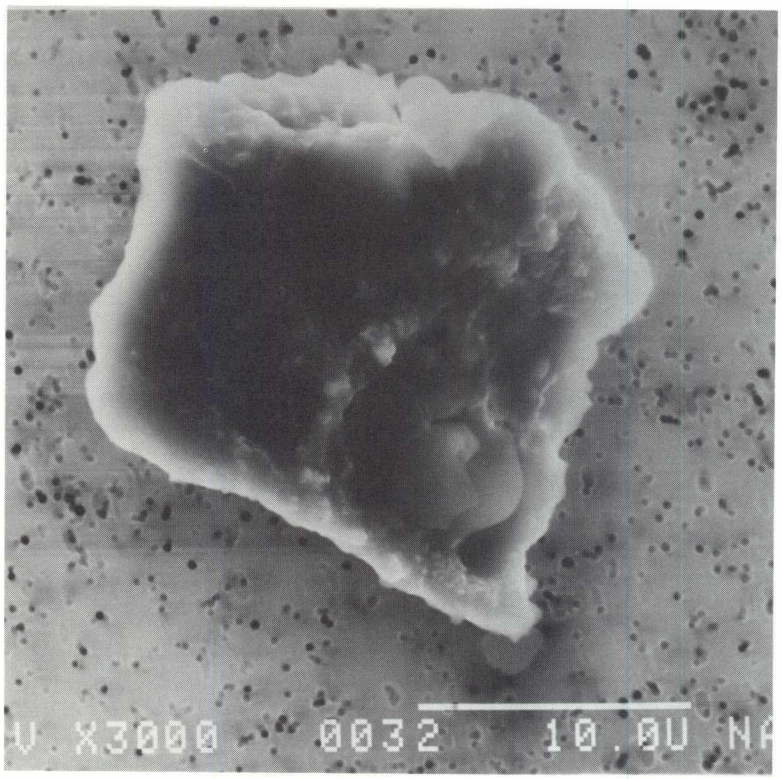
LUSTER: M

TYPE: C

COMMENTS:



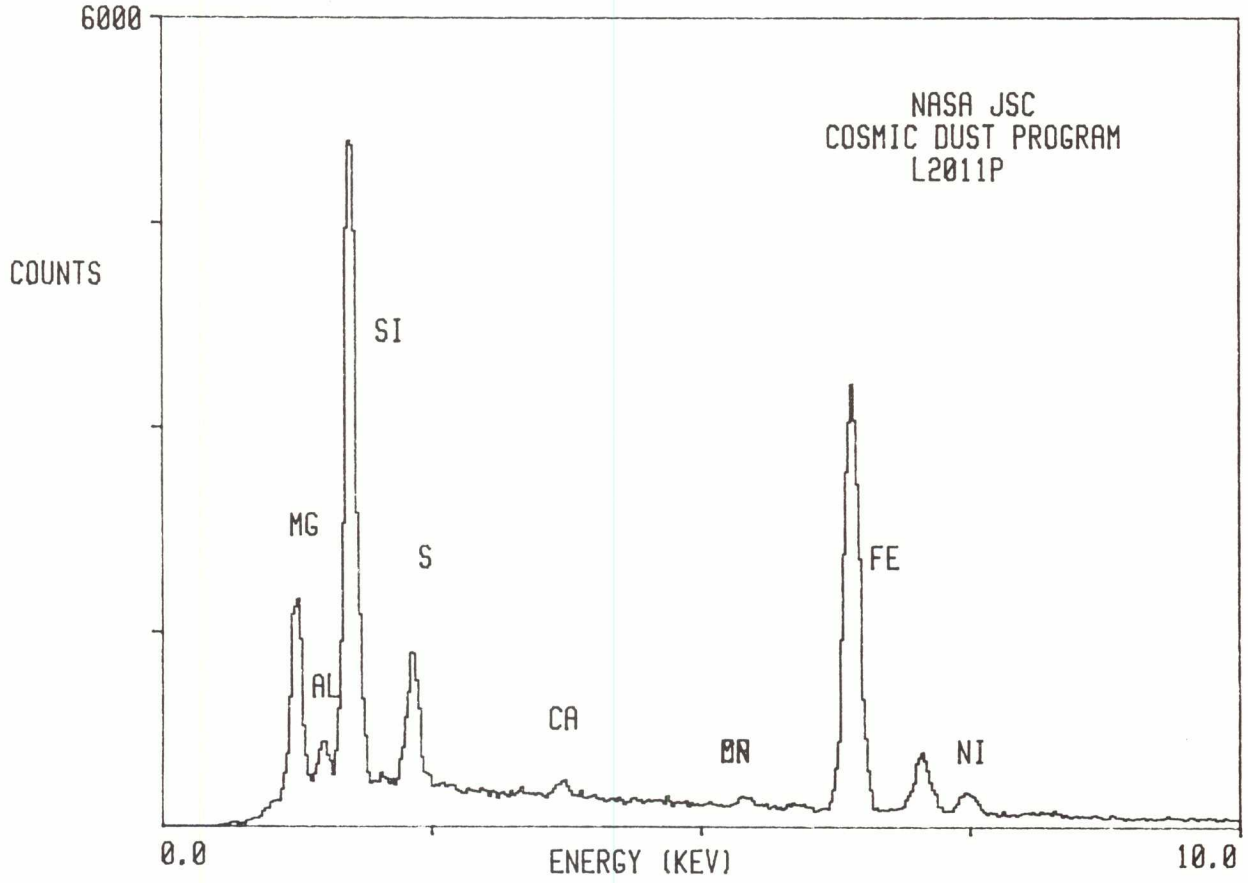
L2011 P 2



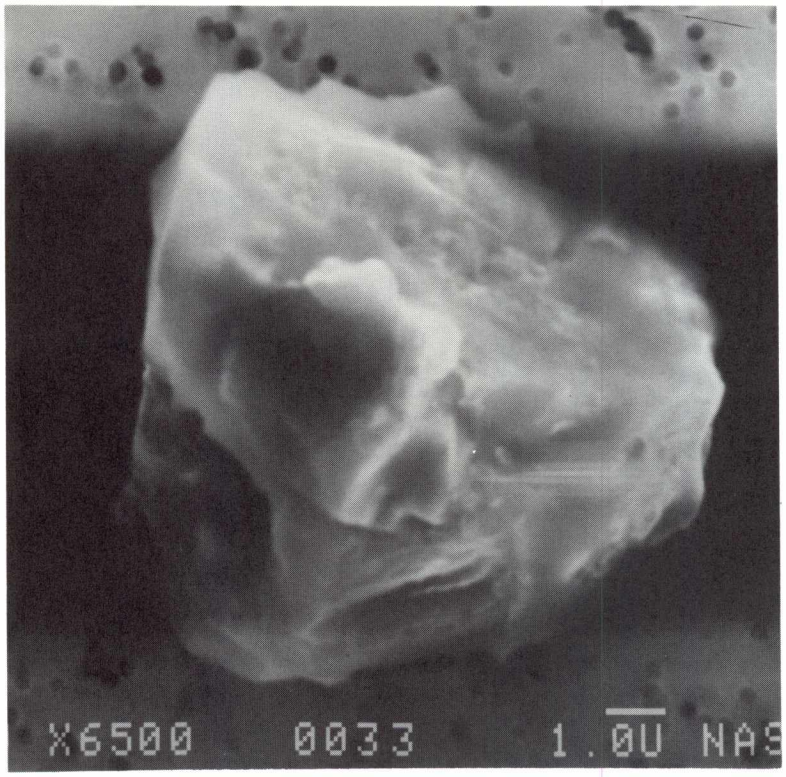
S-92-35263

SIZE: 20x17
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



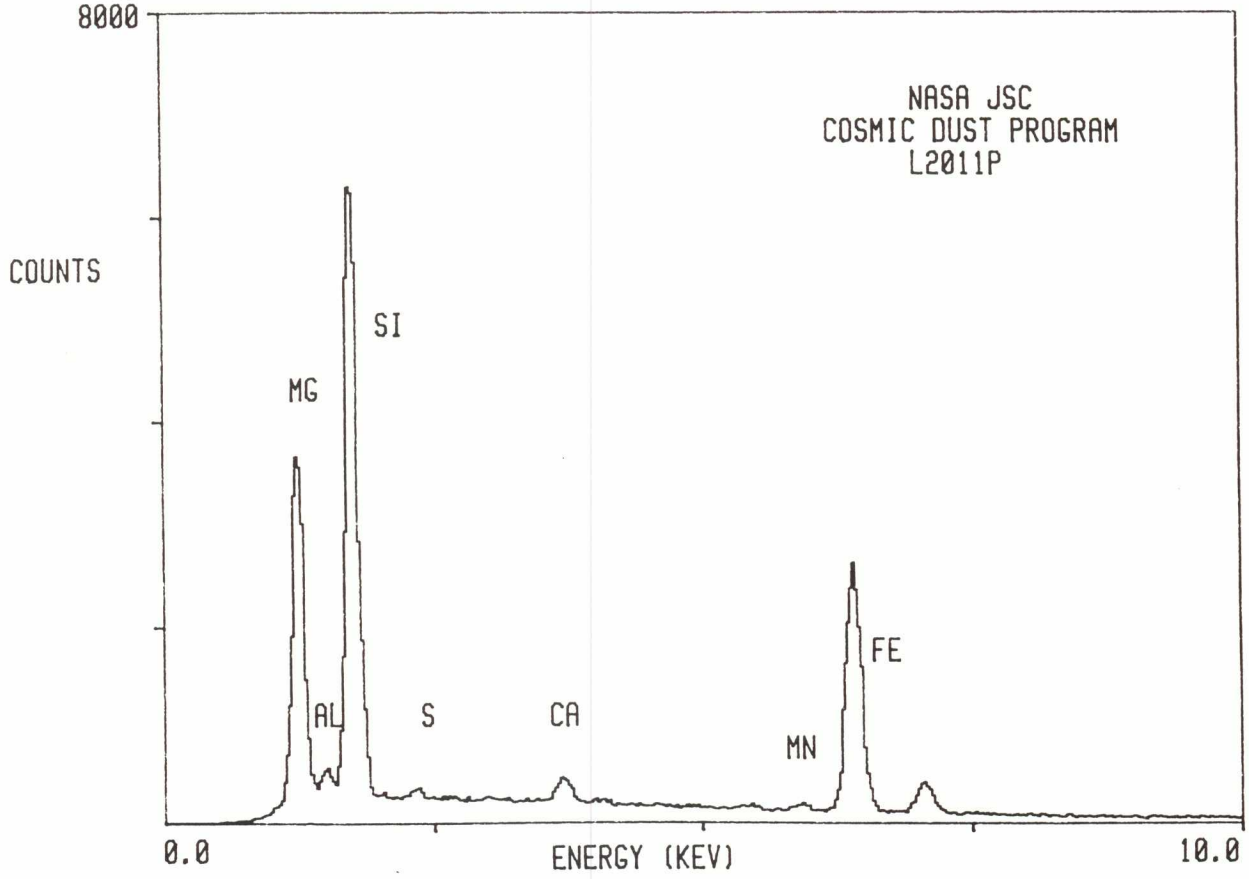
L2011 P 3



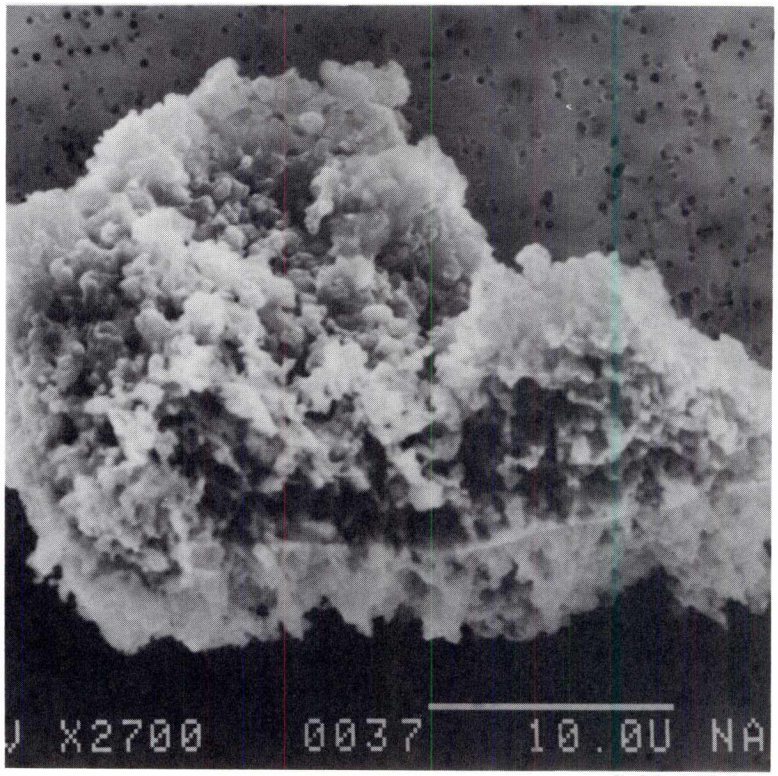
S-92-35264

SIZE: 11x10
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



L2011 P 4



S-92-35265

SIZE: 35x27

SHAPE: I

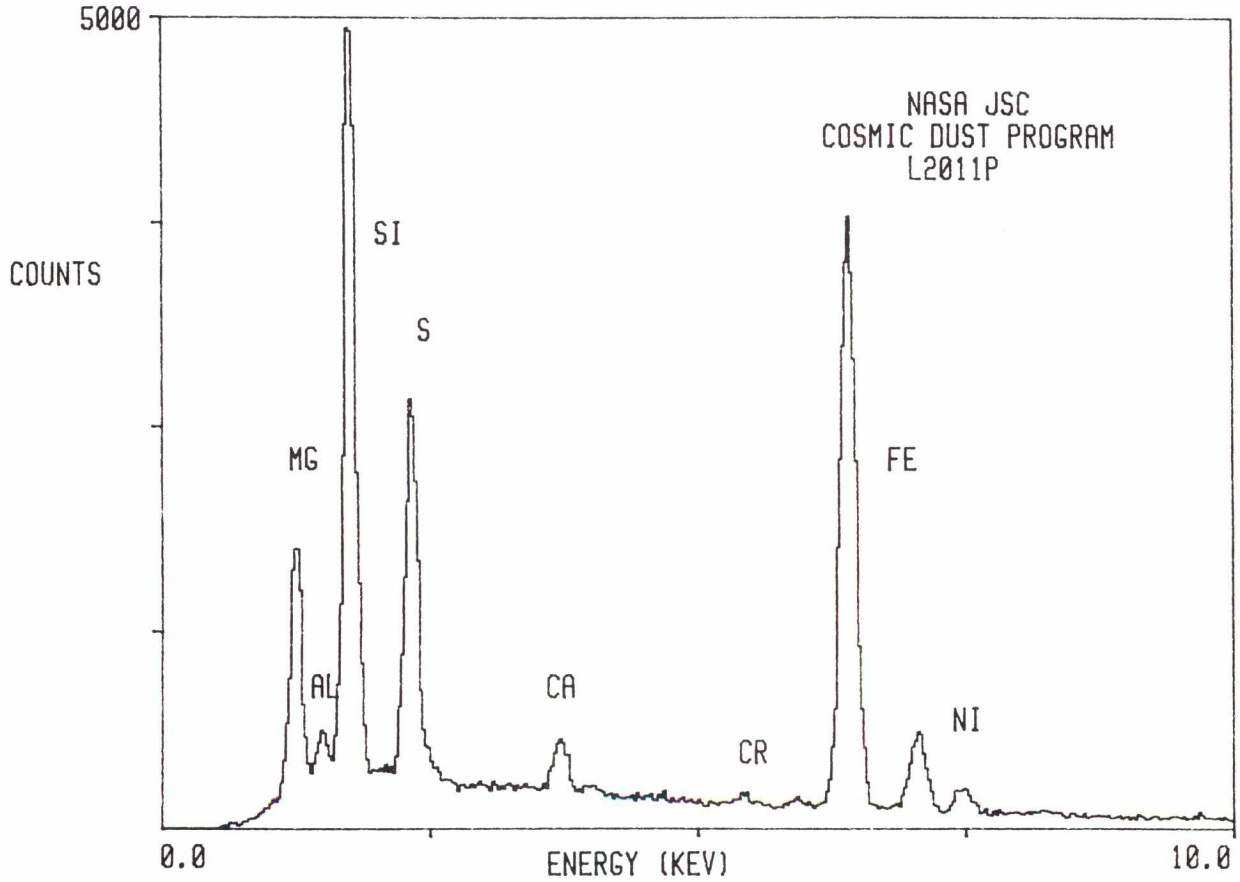
TRANS.: O

COLOR: Brown to Black

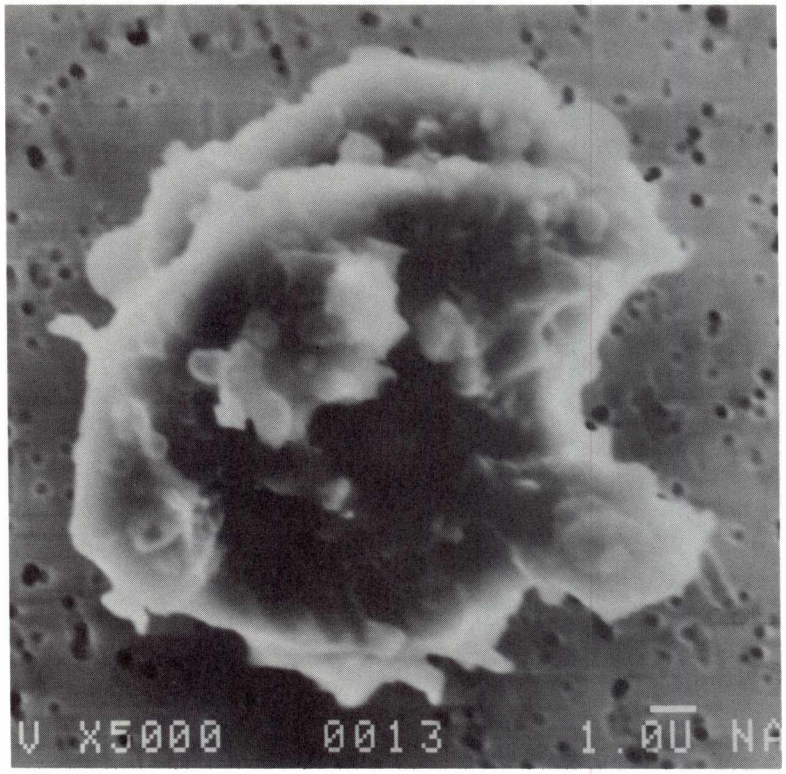
LUSTER: M

TYPE: C

COMMENTS:



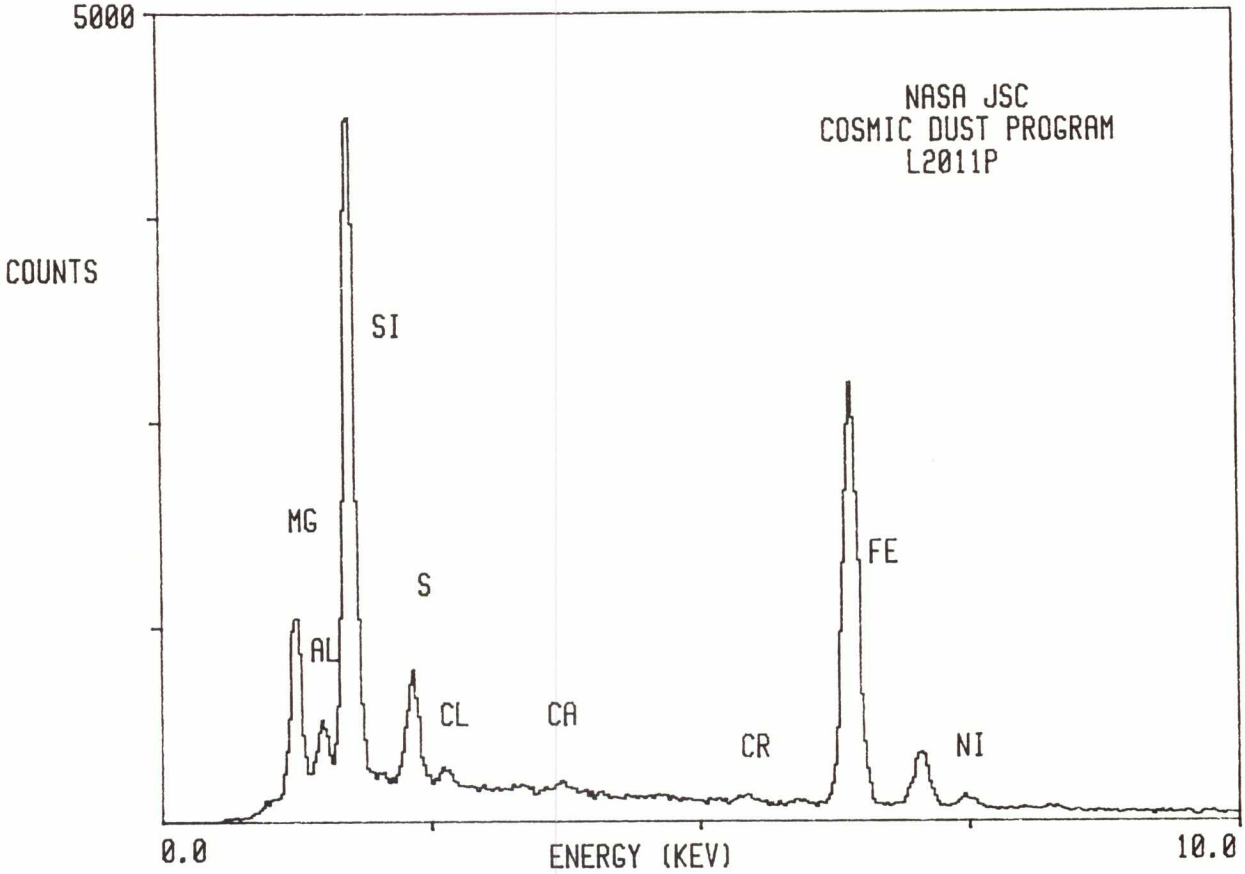
L2011 P 5



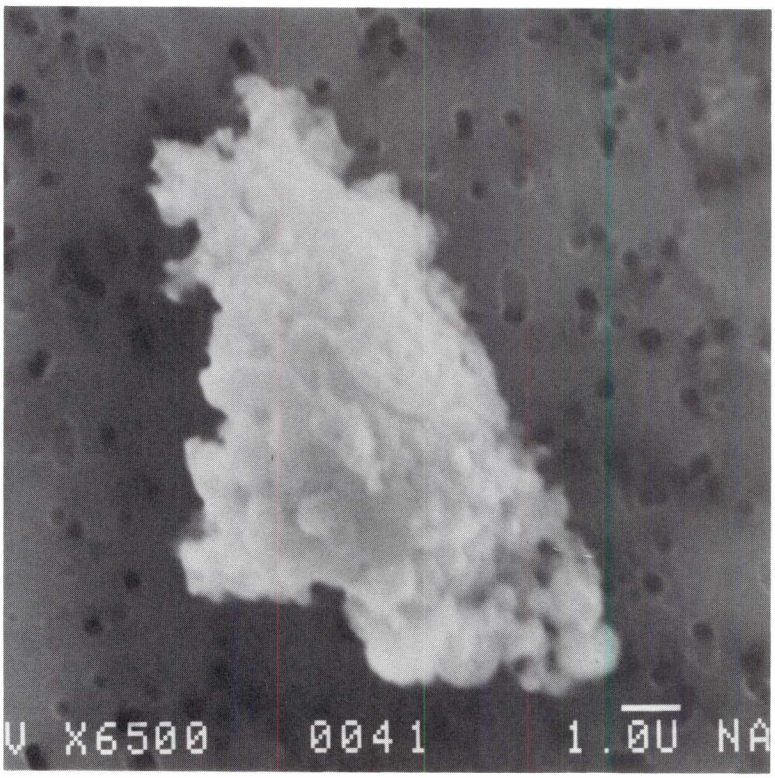
S-92-35266

SIZE: 13x11
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



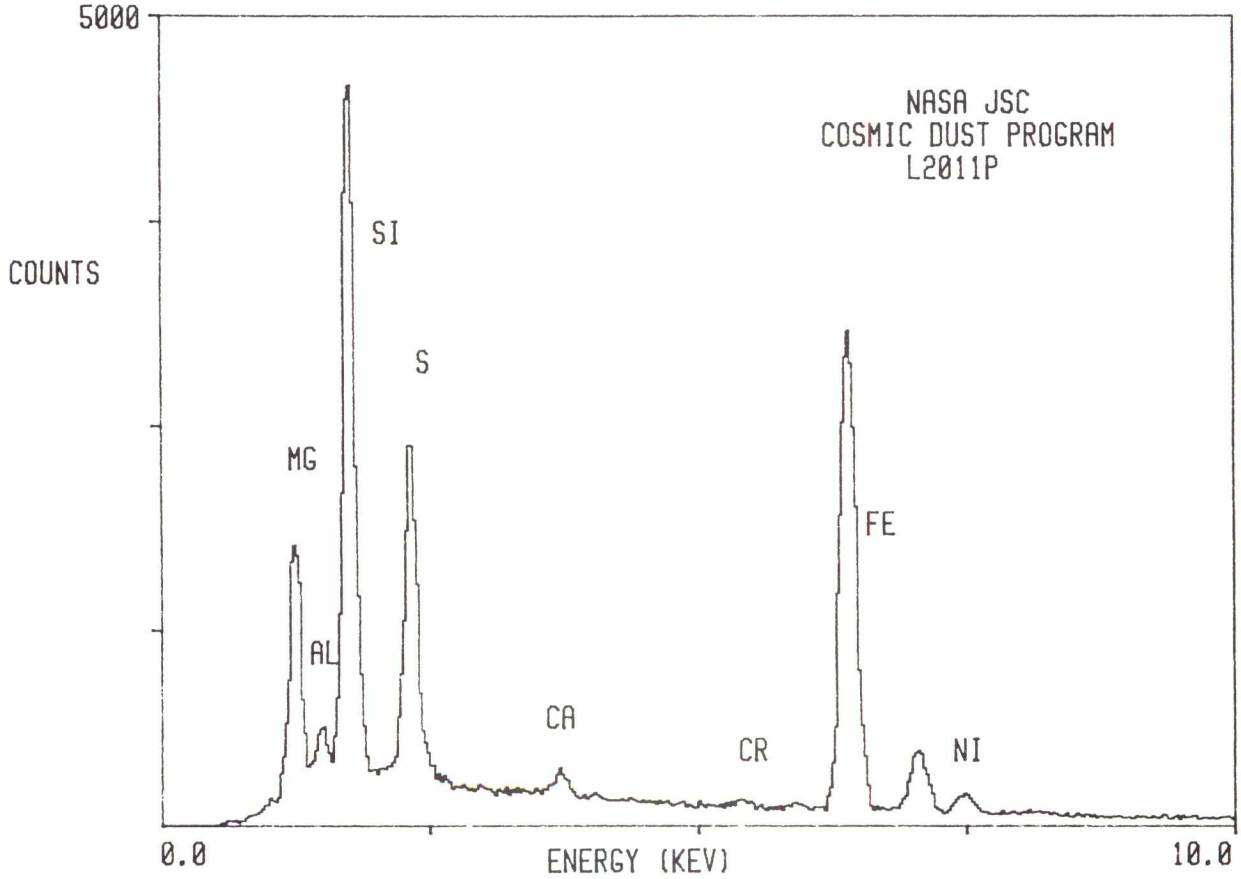
L2011 P 7



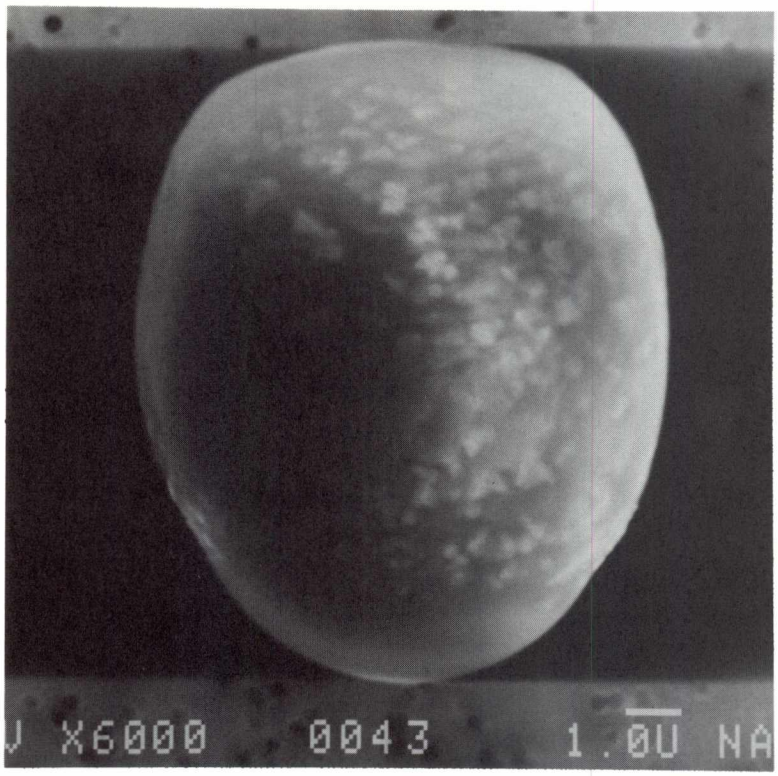
S-92-35268

SIZE: 12x5
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



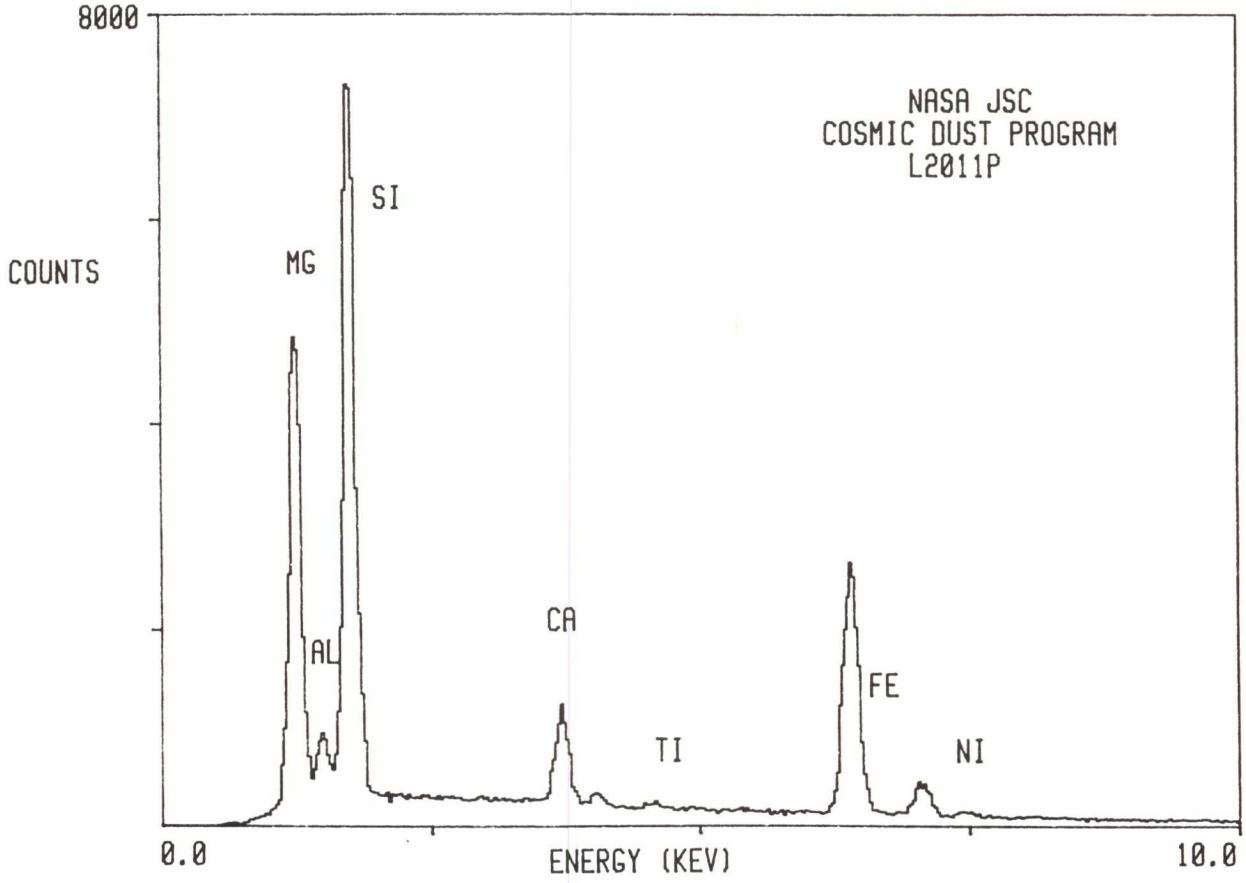
L2011 P 8



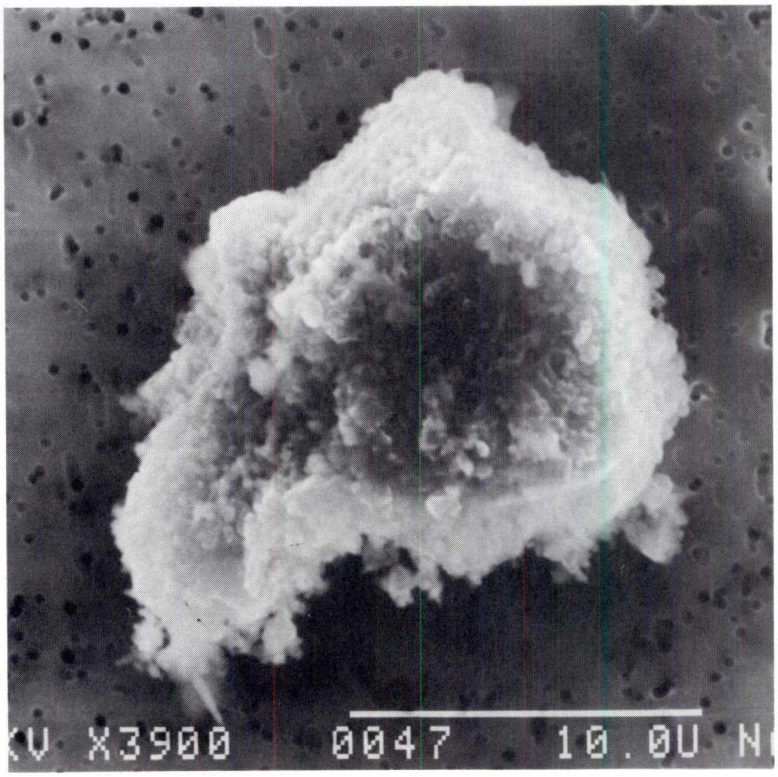
S-92-35269

SIZE: 11
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



L2011 P 11



S-92-35272

SIZE: 17x15

SHAPE: I

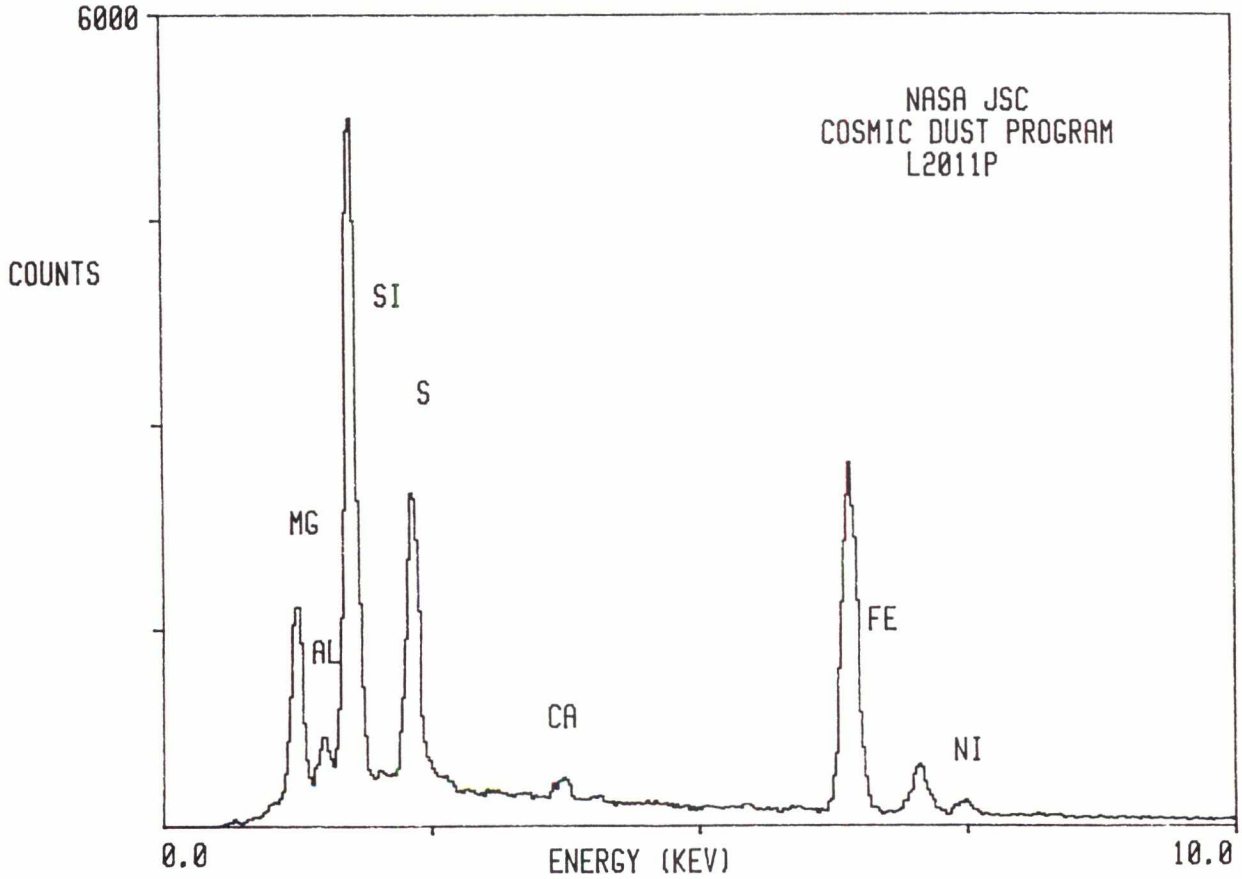
TRANS.: O

COLOR: Black

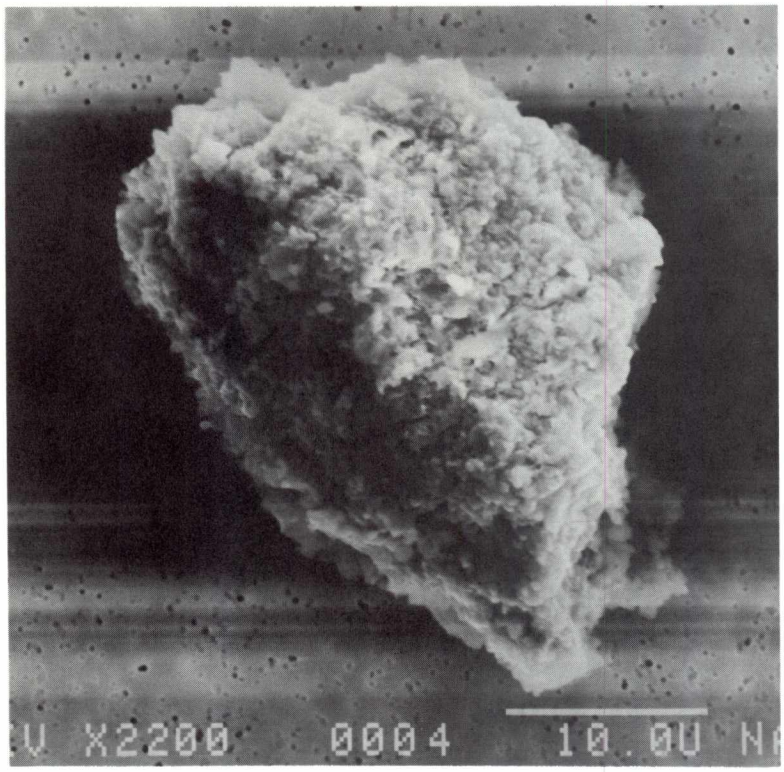
LUSTER: D

TYPE: C

COMMENTS:



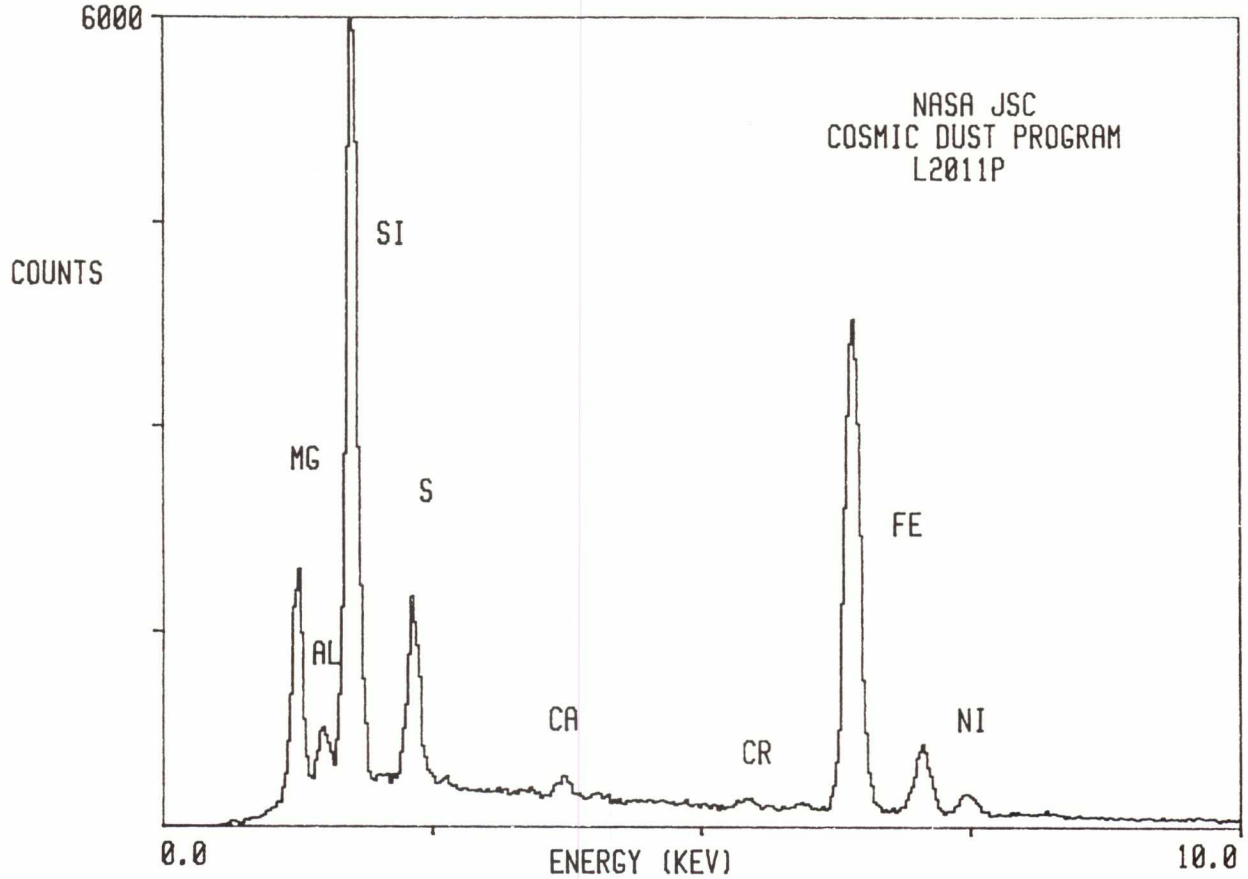
L2011 P 12



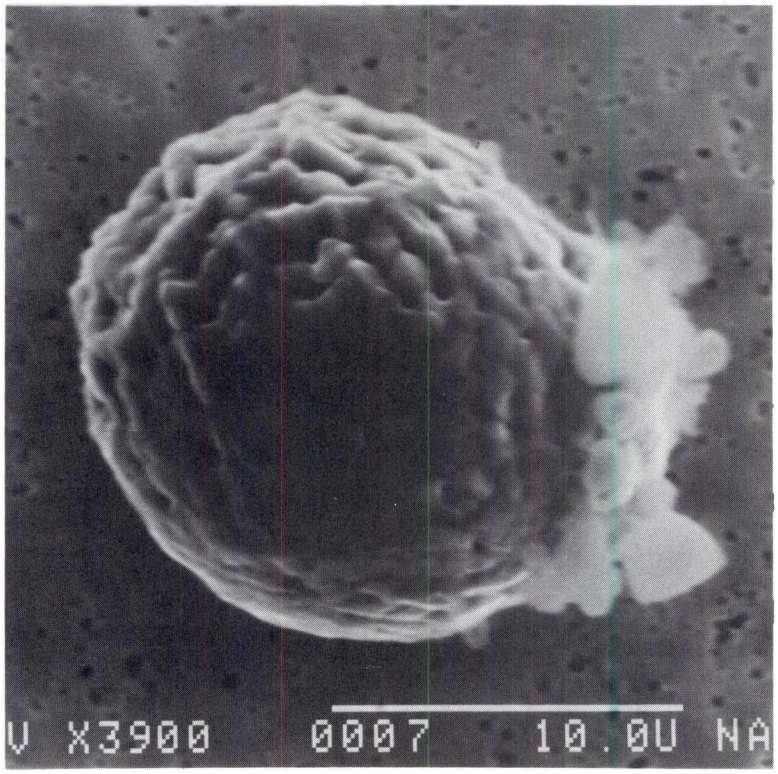
S-92-35273

SIZE: 35x25
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



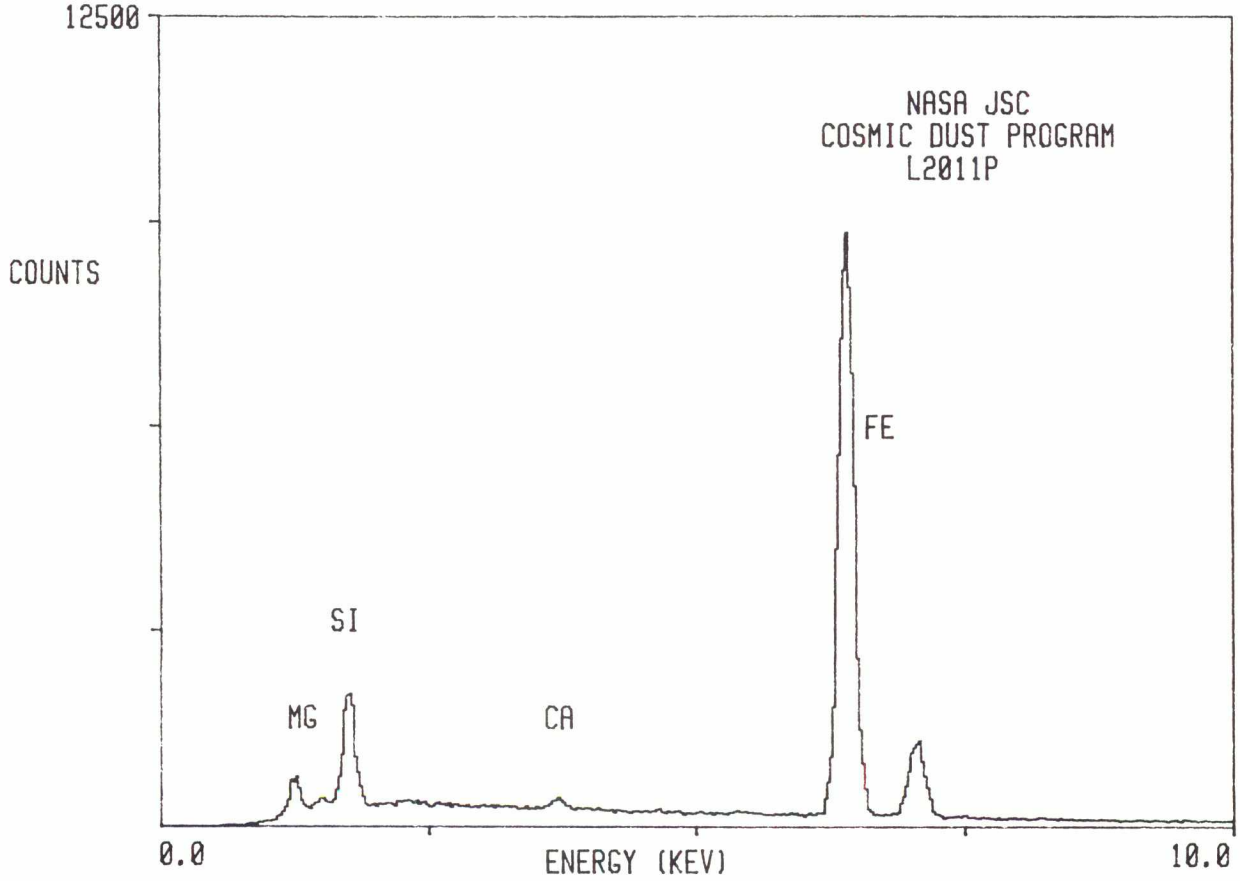
L2011 P 13



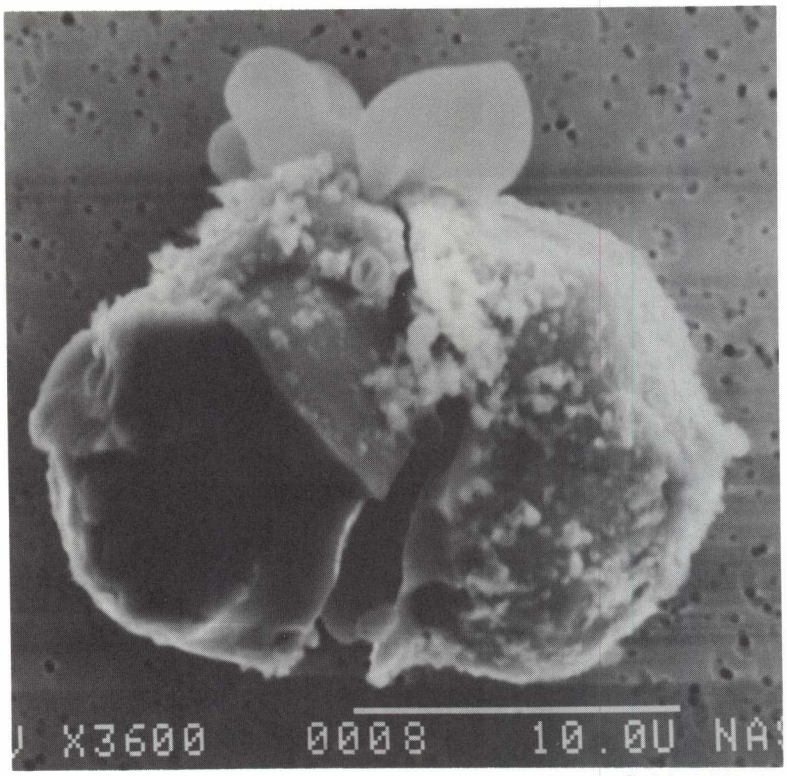
S-92-35274

SIZE: 15
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C?

COMMENTS:



L2011 P 14



S-92-35275

SIZE: 24x20

SHAPE: I

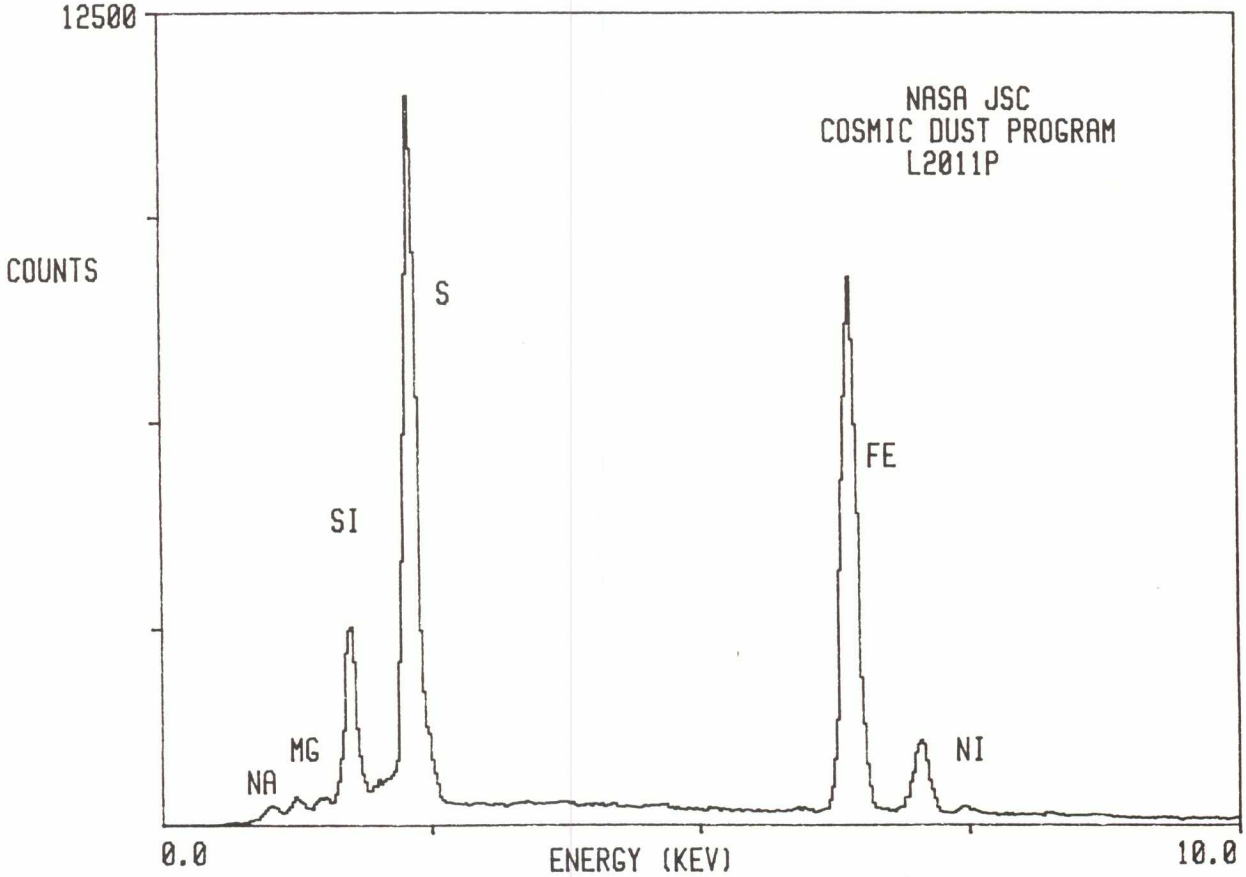
TRANS.: O

COLOR: Brown to Black

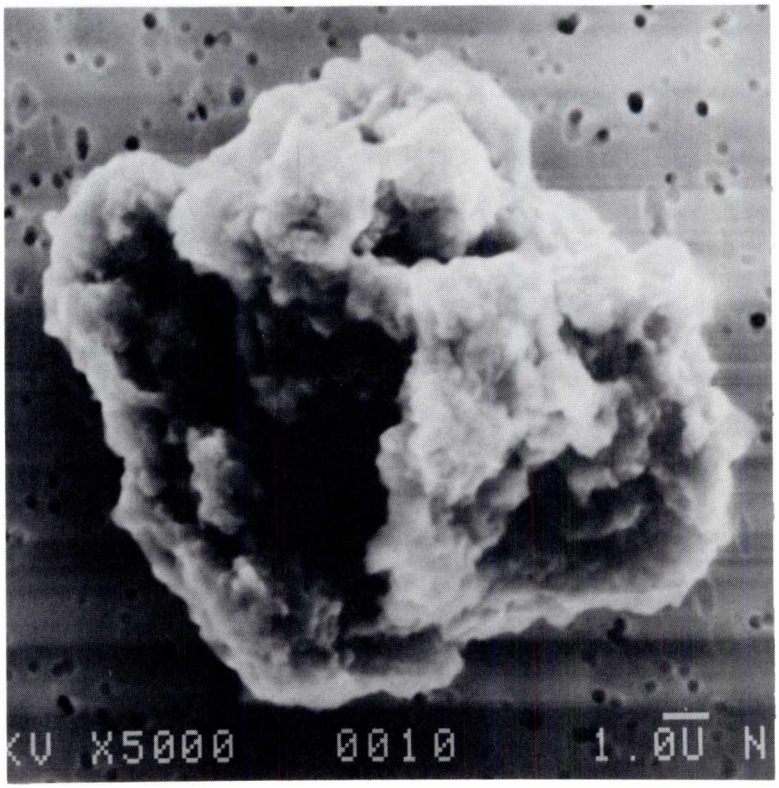
LUSTER: M

TYPE: C

COMMENTS:



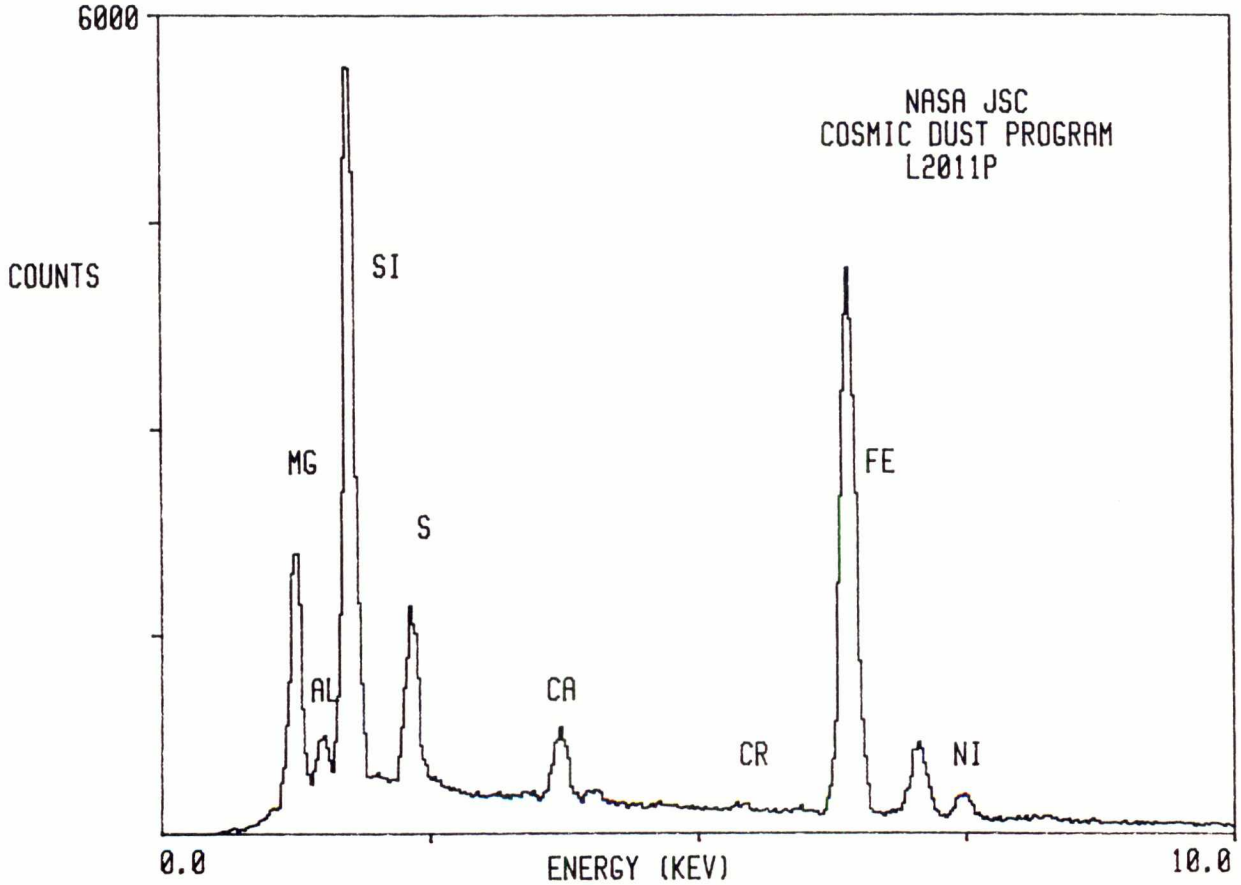
L2011 P 15



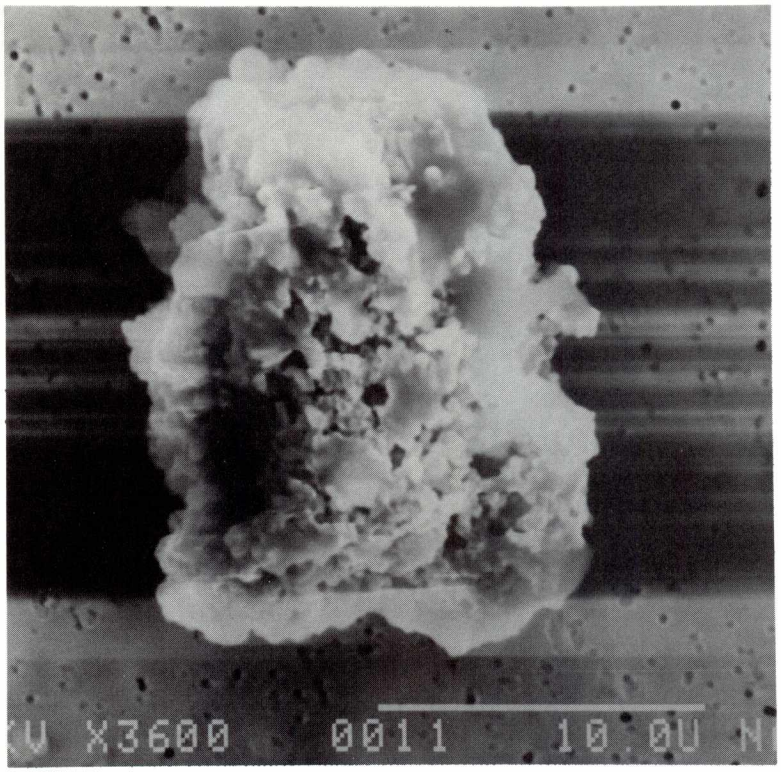
S-92-35276

SIZE: 14x13
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



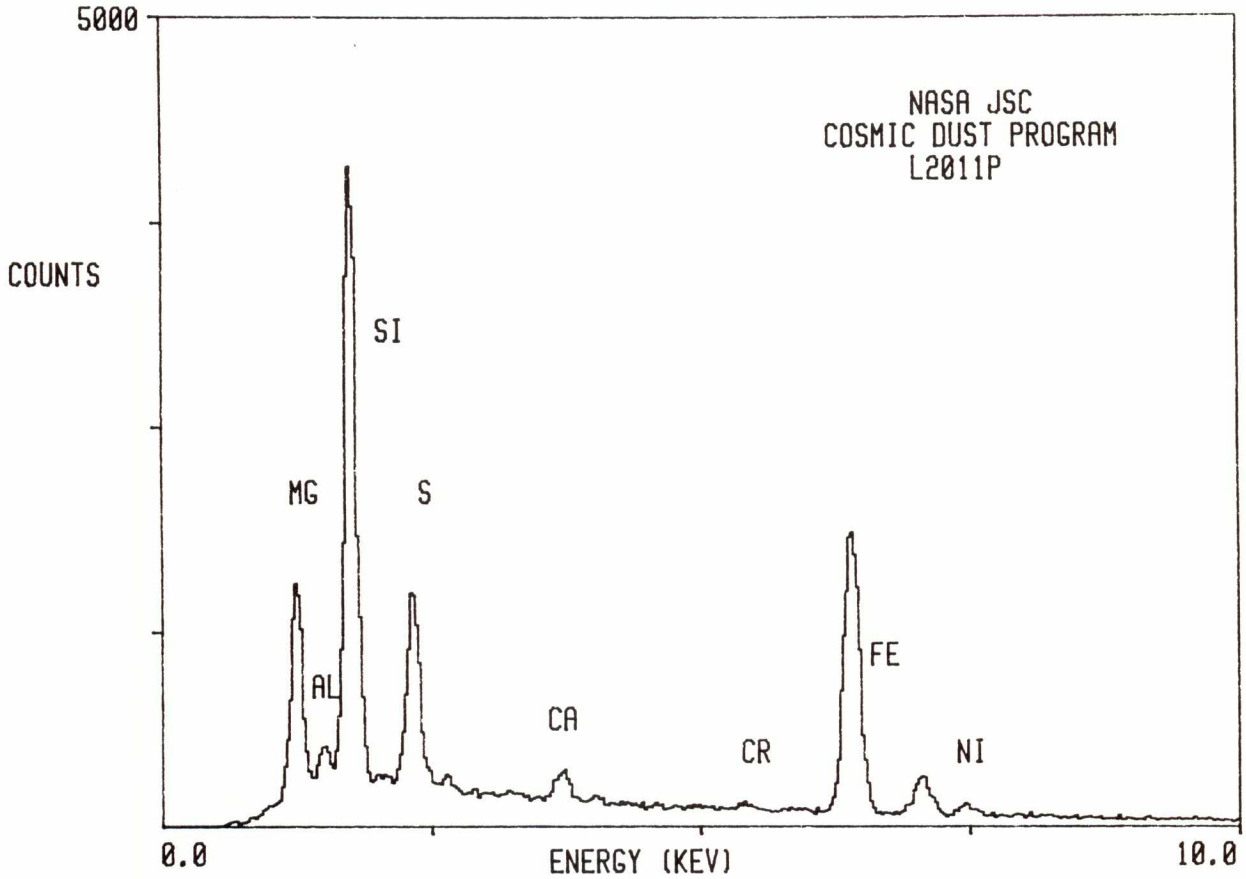
L2011 P 16



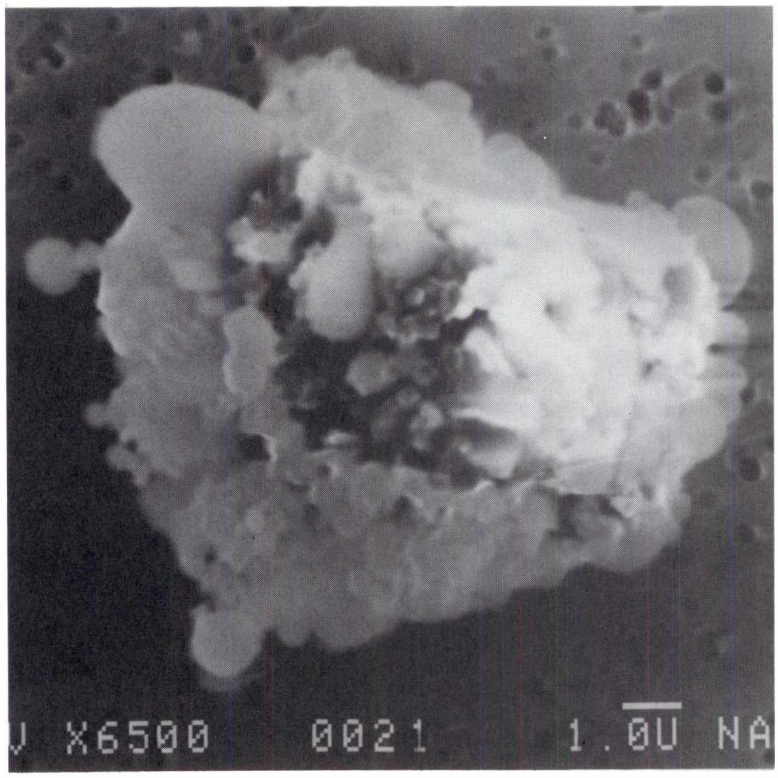
S-92-35277

SIZE: 19x16
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



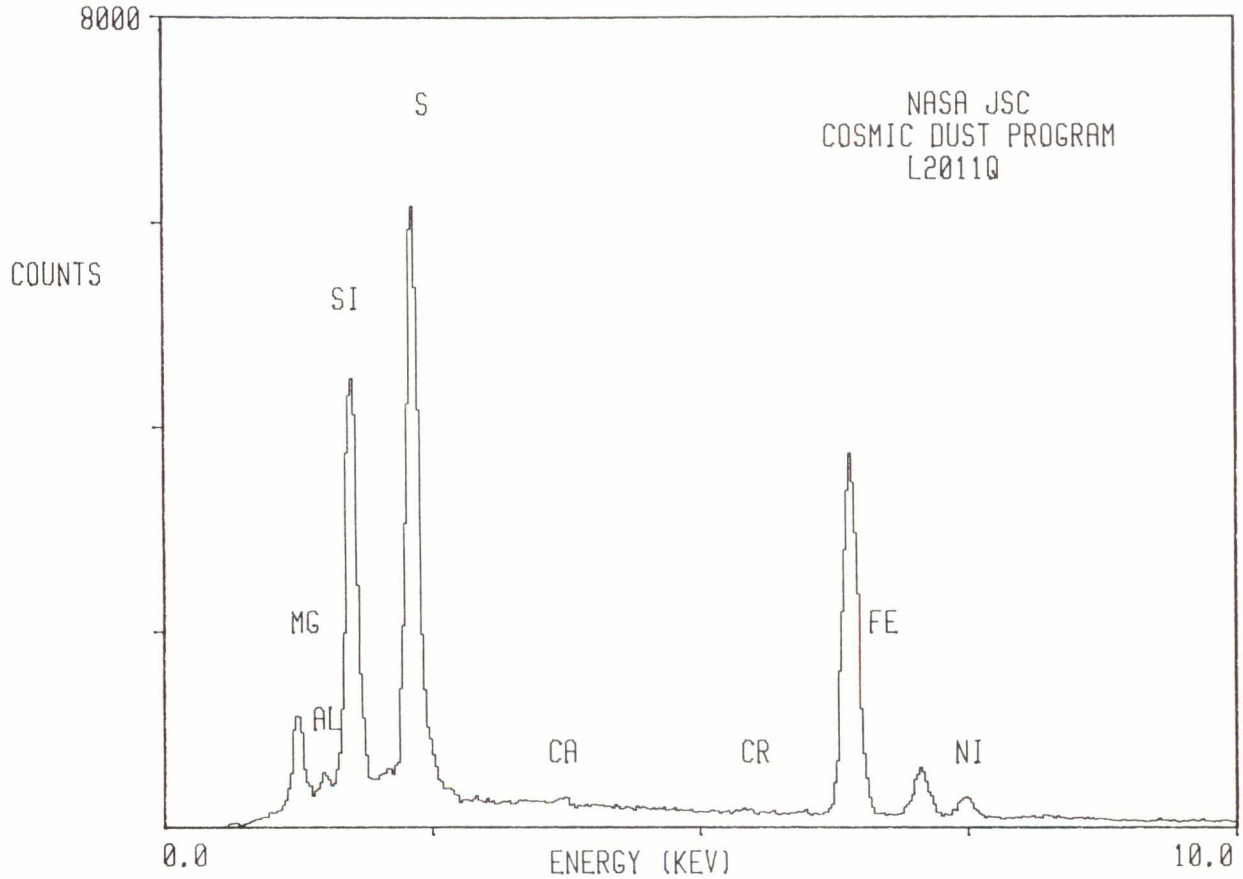
L2011 Q 2



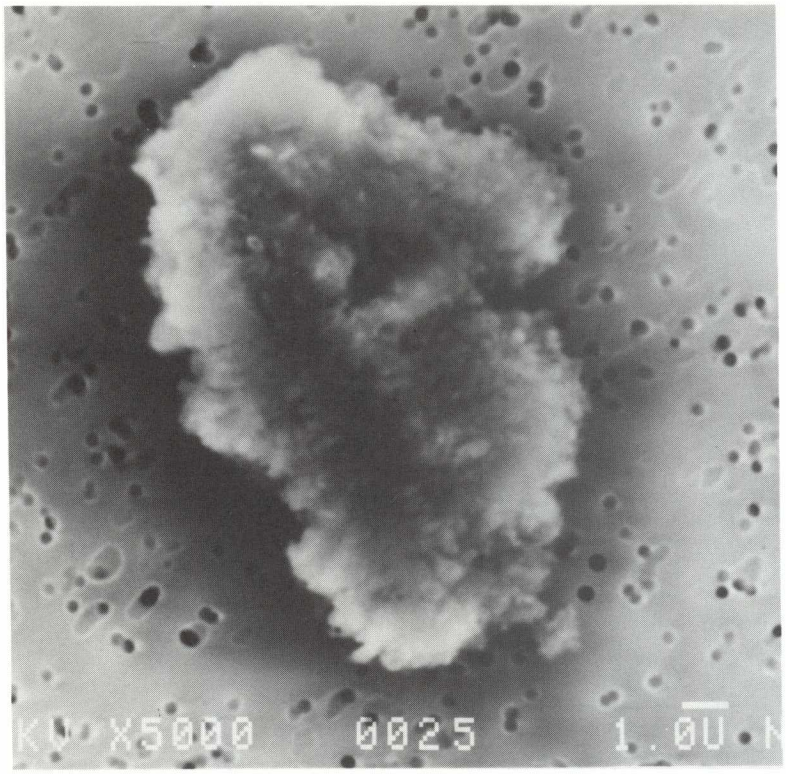
S-92-35249

SIZE: 11
SHAPE: I
TRANS.: O
COLOR: Black to White
LUSTER: R
TYPE: C

COMMENTS:



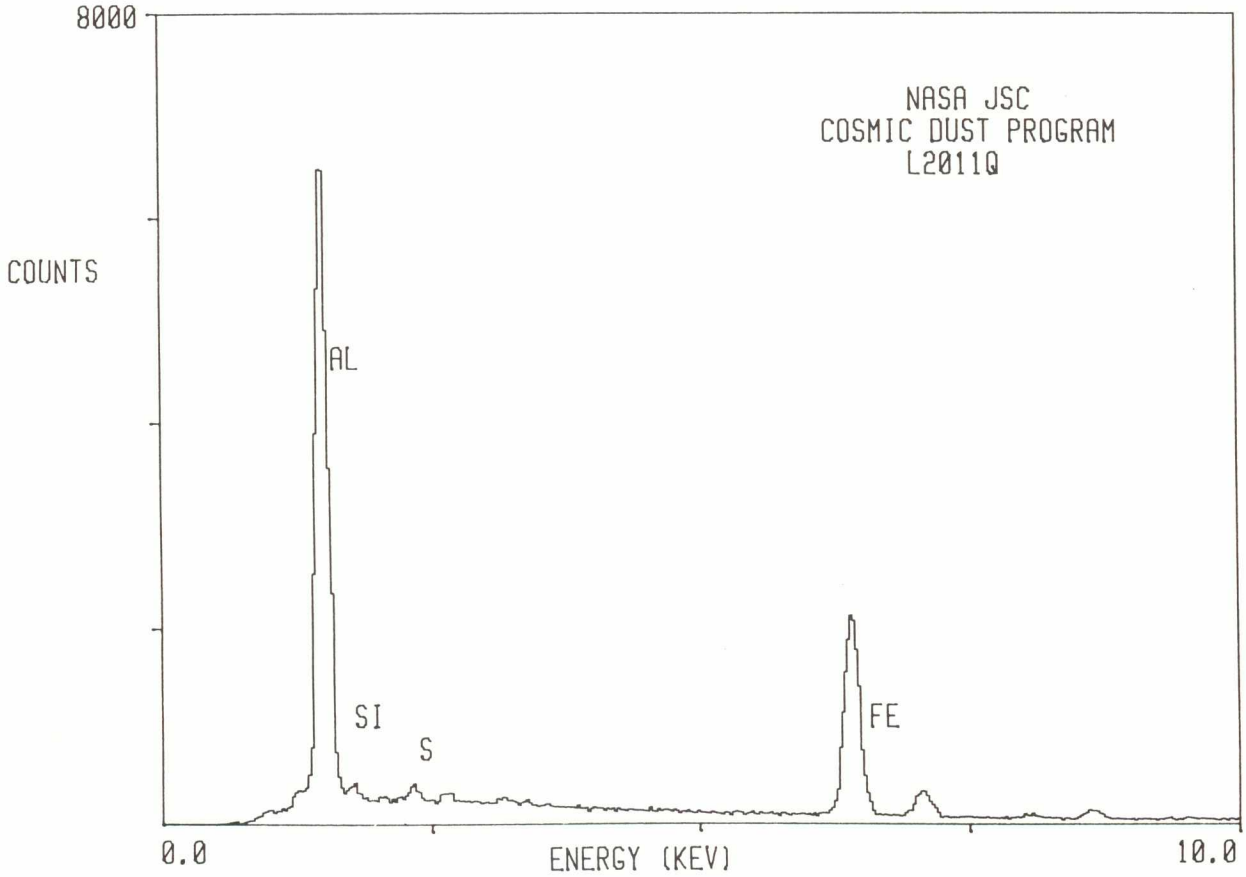
L2011 Q 3



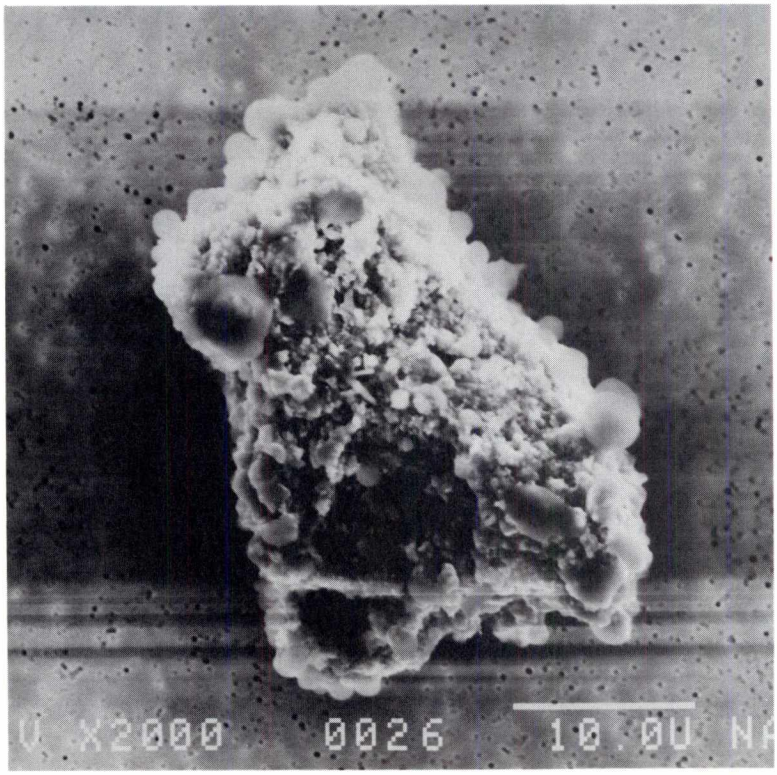
S-92-35250

SIZE: 13x9
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



L2011 Q 4



S-92-35251

SIZE: 35x26

SHAPE: I

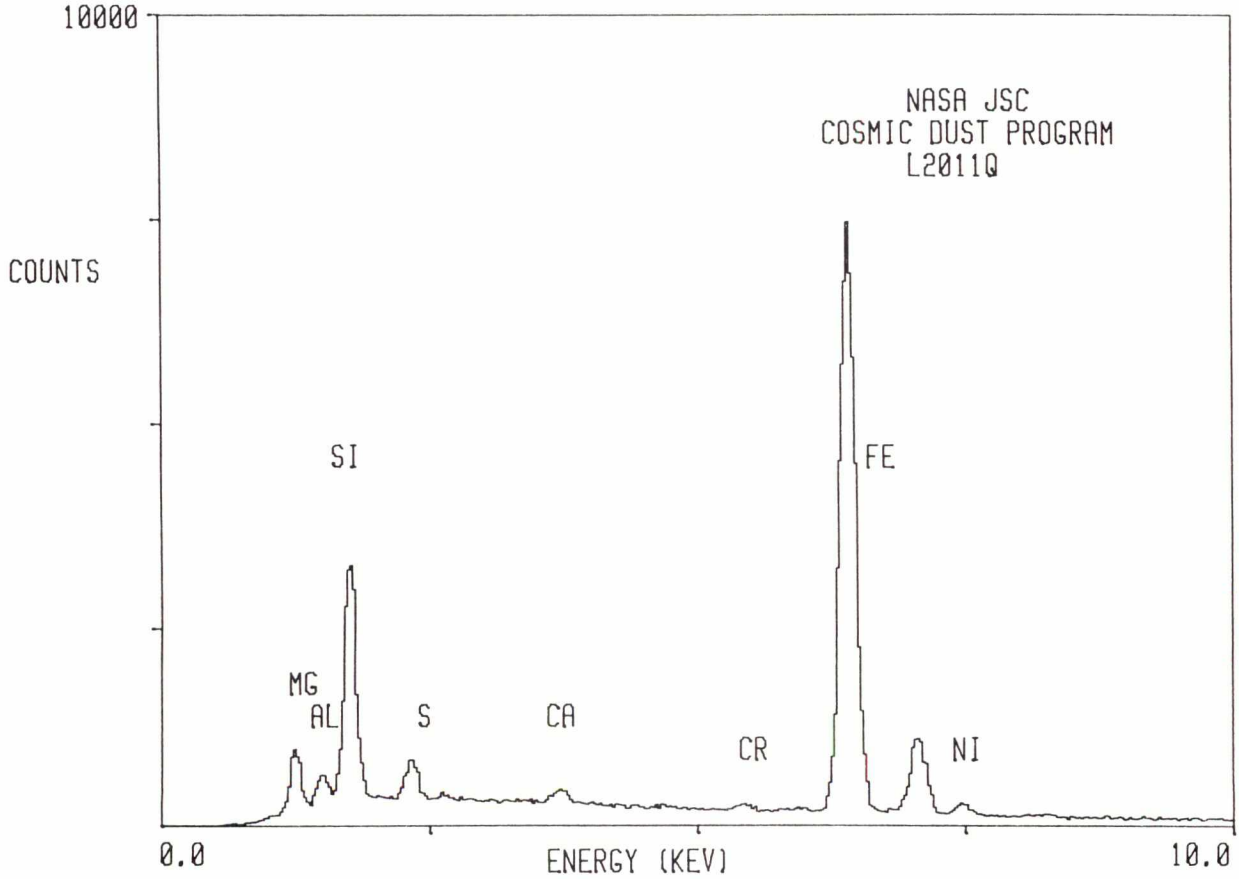
TRANS.: O

COLOR: Black to White

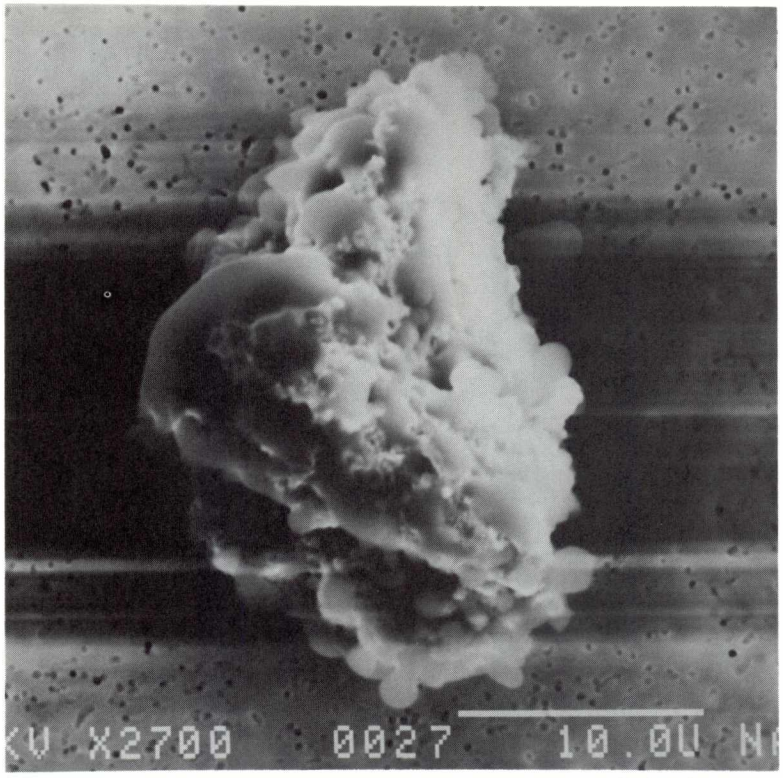
LUSTER: M

TYPE: C?

COMMENTS:



L2011 Q 5



S-92-35252

SIZE: 24x22

SHAPE: E

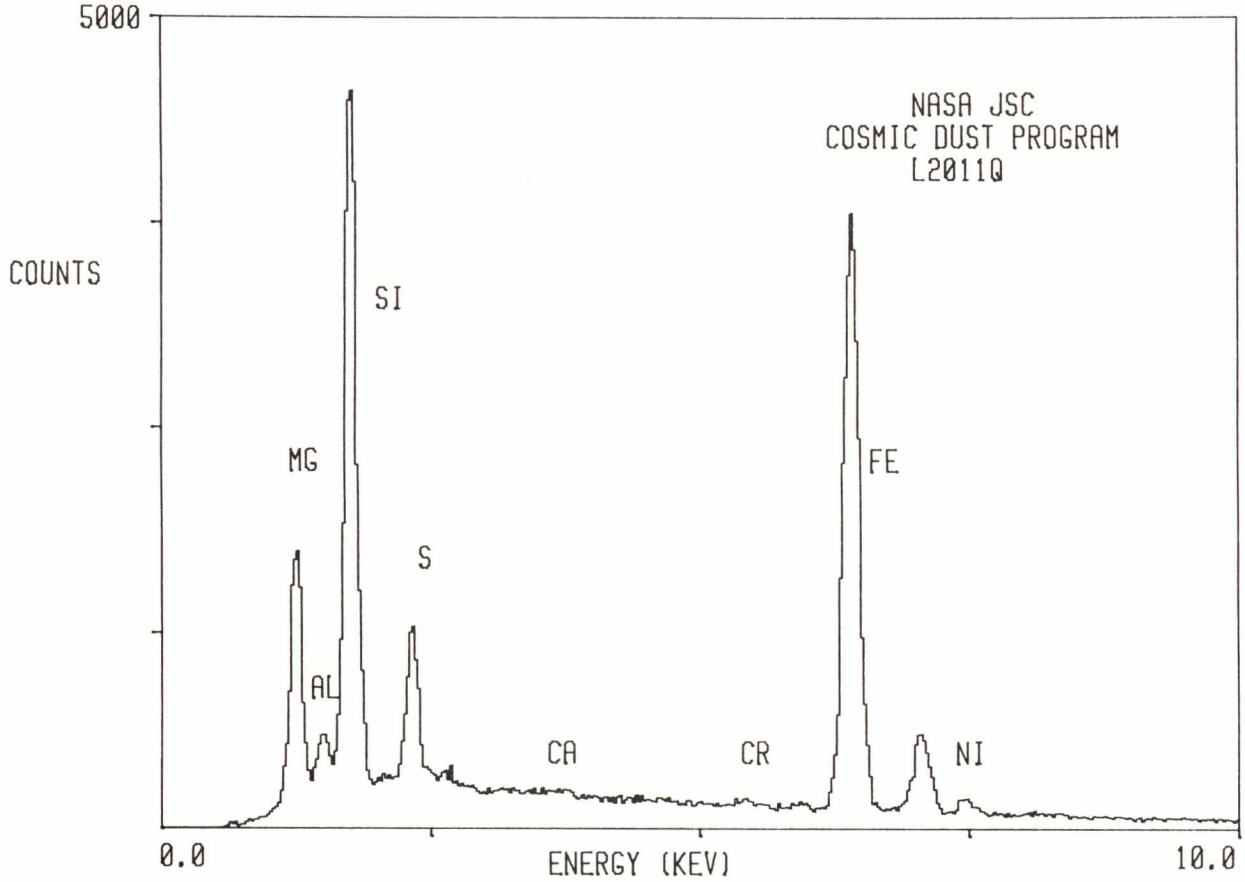
TRANS.: O

COLOR: Black to White

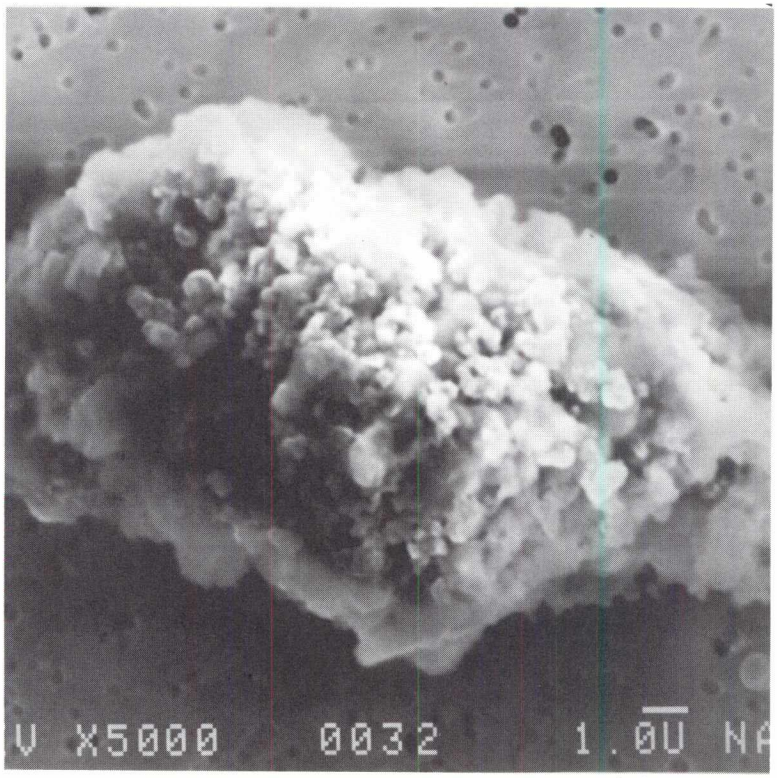
LUSTER: M

TYPE: C

COMMENTS:



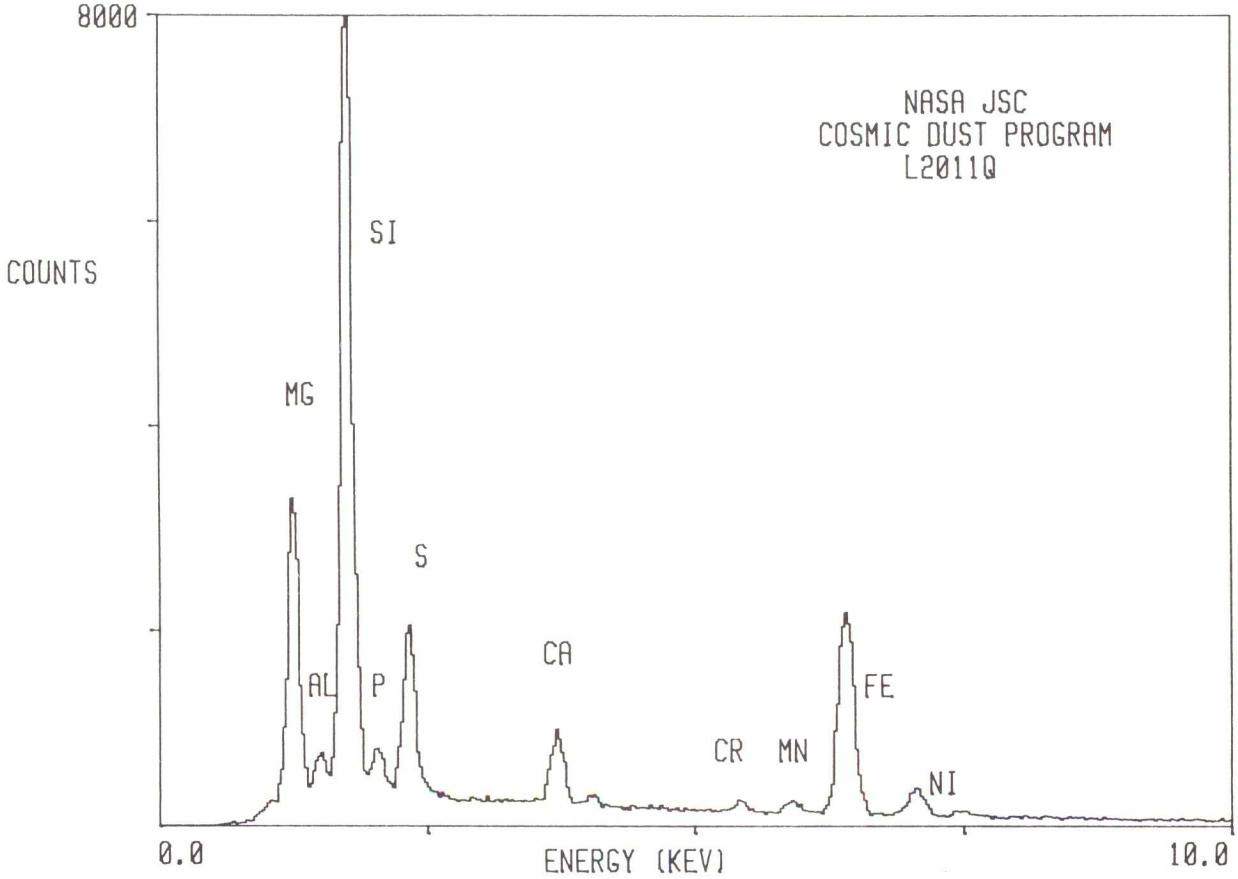
L2011 Q 7



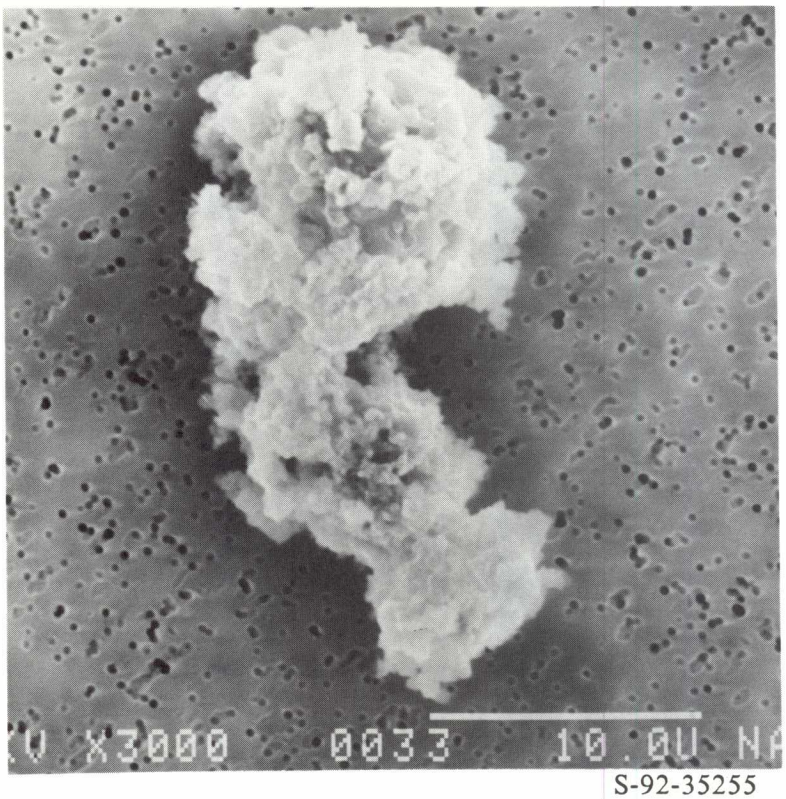
S-92-35254

SIZE: 20x11
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



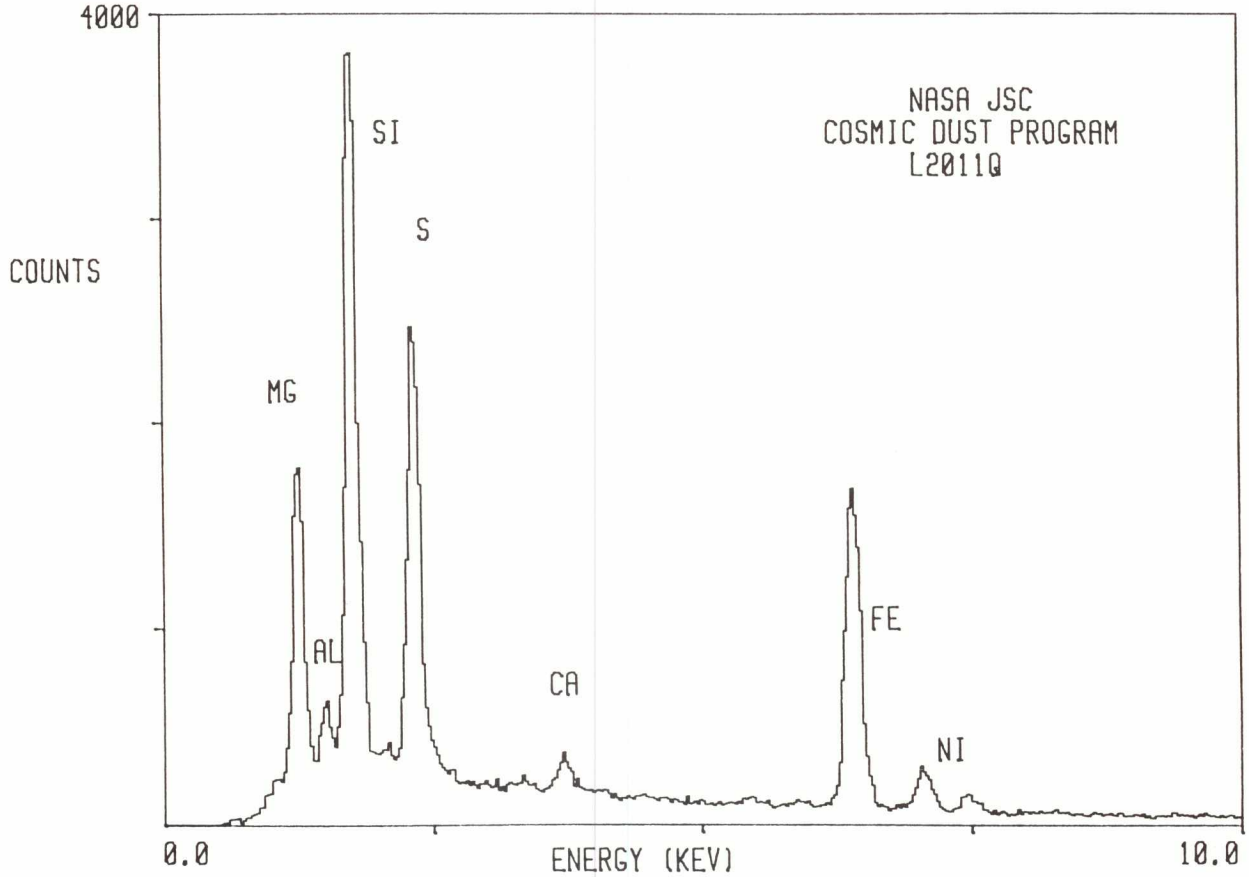
L2011 Q 8



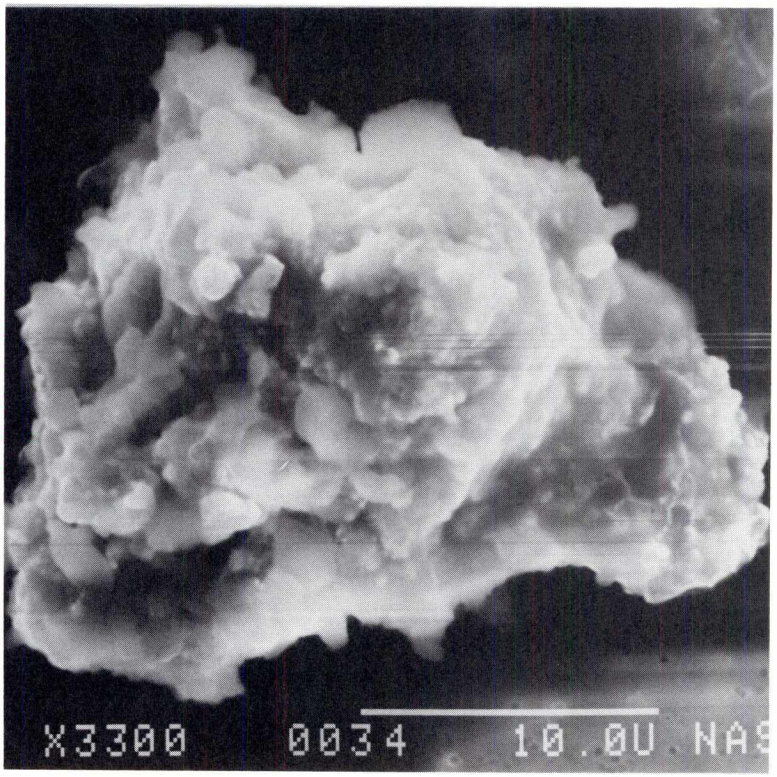
S-92-35255

SIZE: 27x13
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: SM
TYPE: C

COMMENTS:



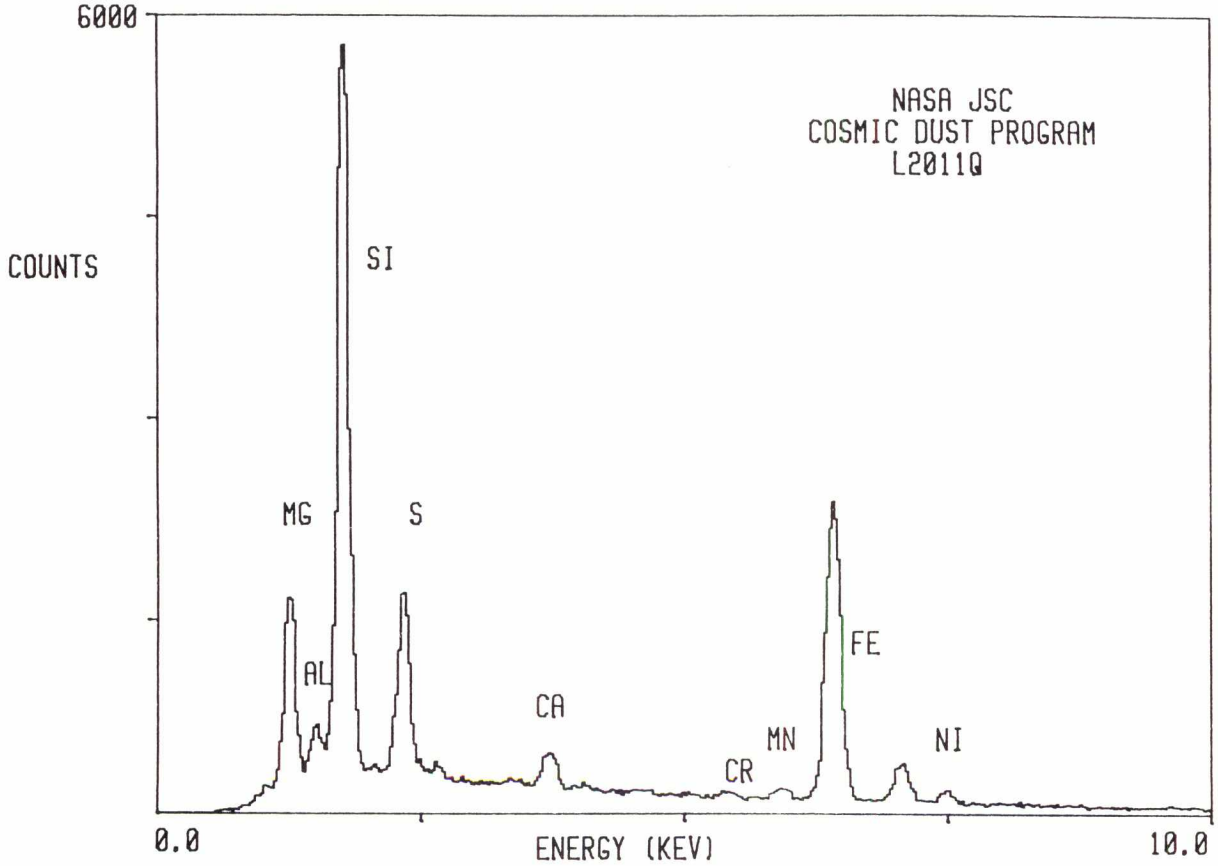
L2011 Q 9



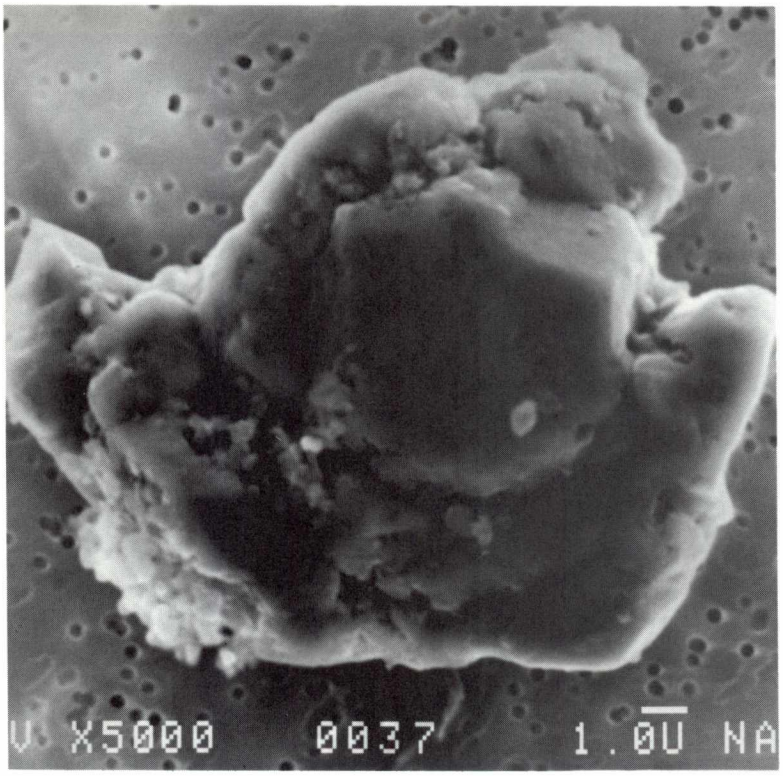
S-92-35256

SIZE: 28x22
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



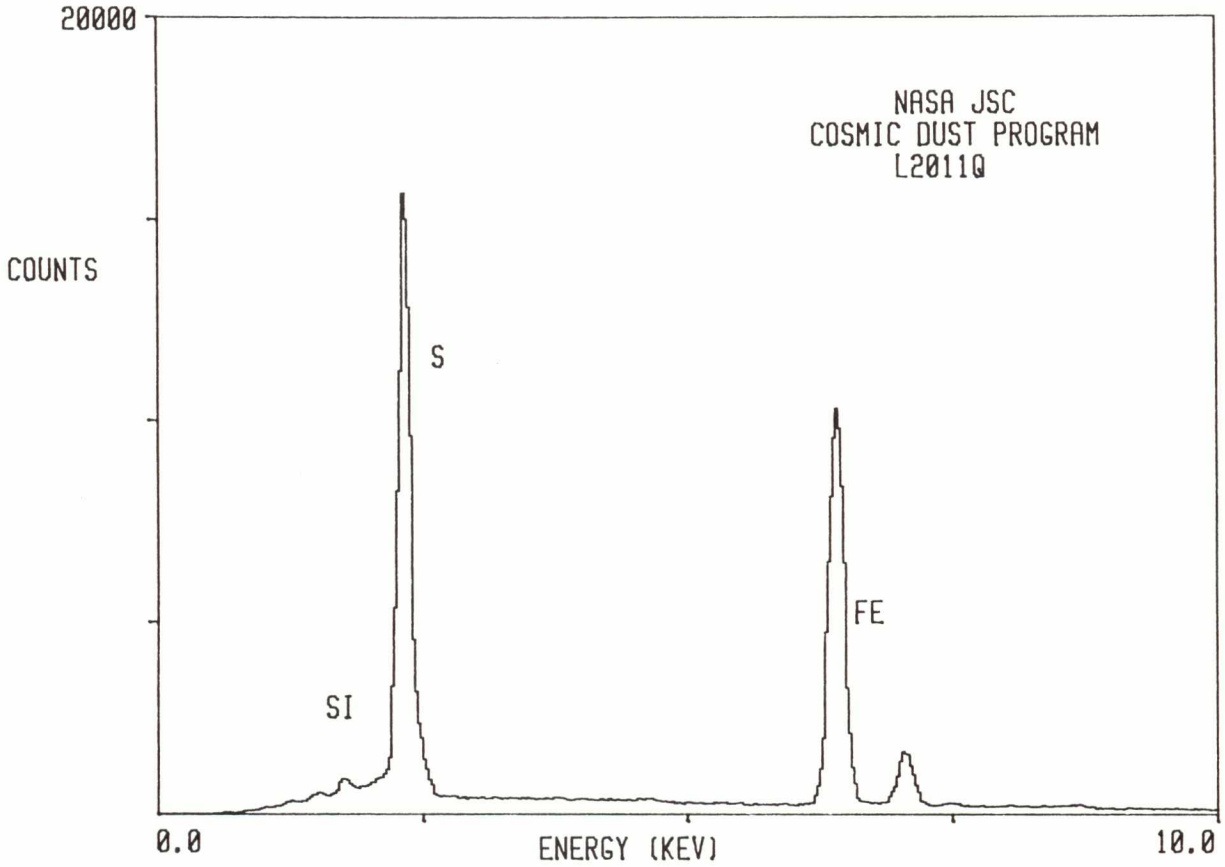
L2011 Q 10



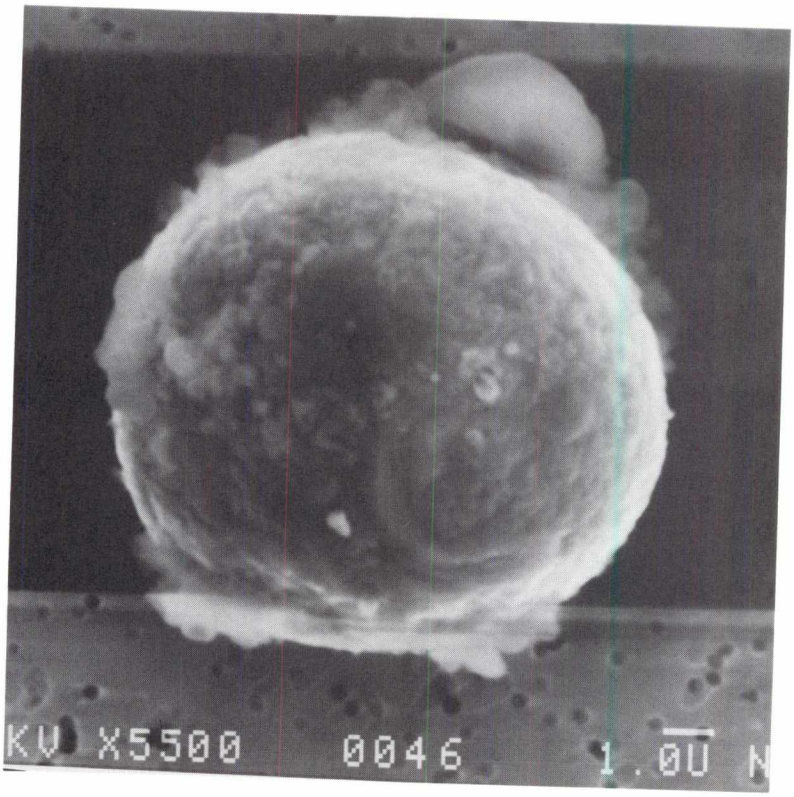
S-92-35257

SIZE: 17x15
SHAPE: I
TRANS.: O
COLOR: Brown
LUSTER: R
TYPE: C

COMMENTS:



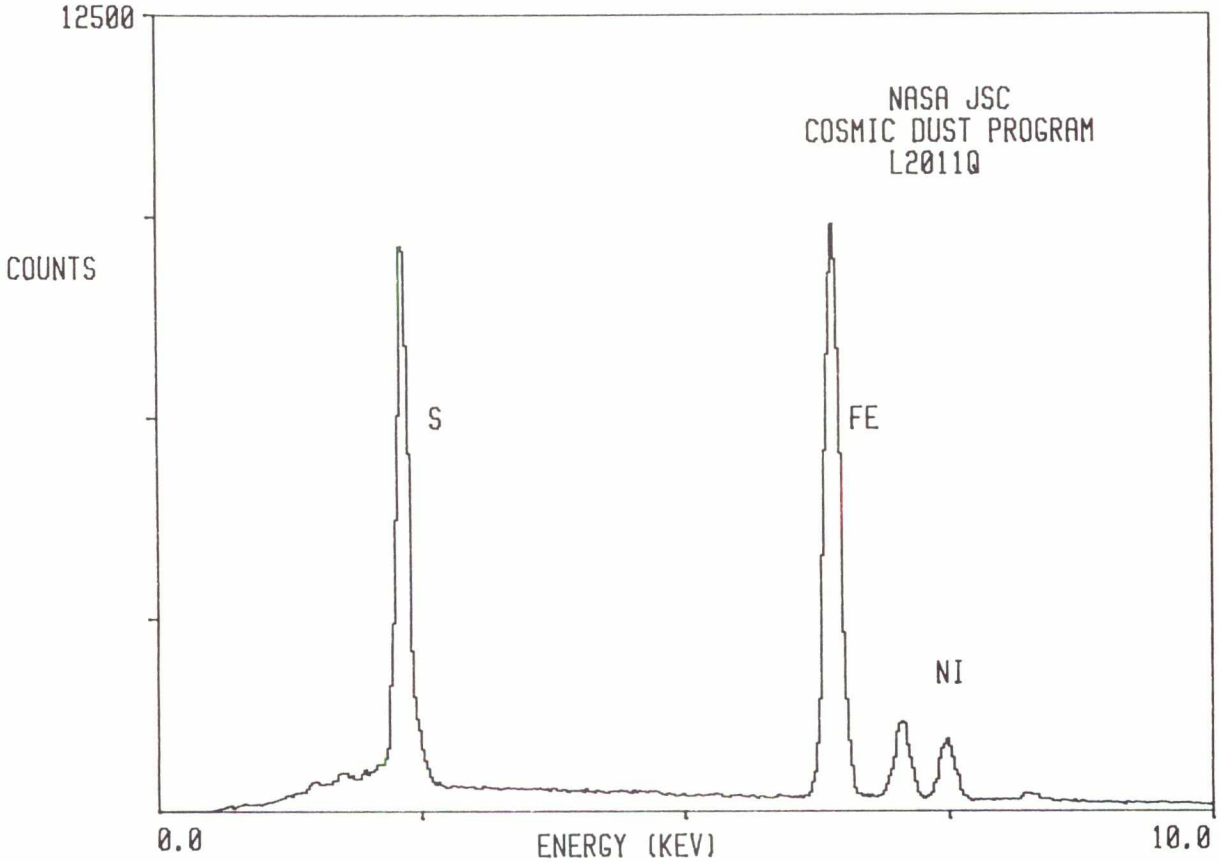
L2011 Q 11



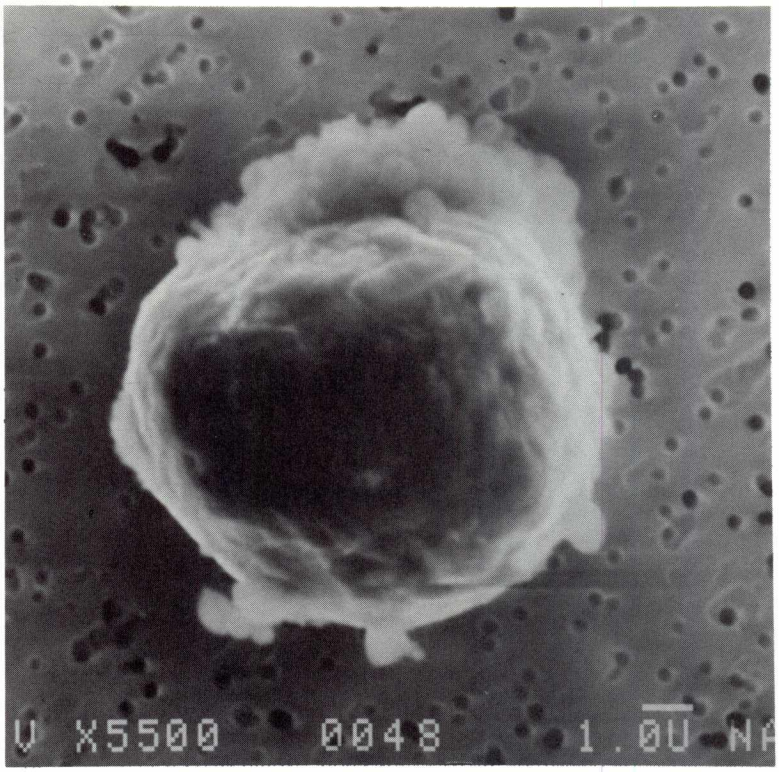
S-92-35258

SIZE: 14
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: SM
TYPE: C

COMMENTS:



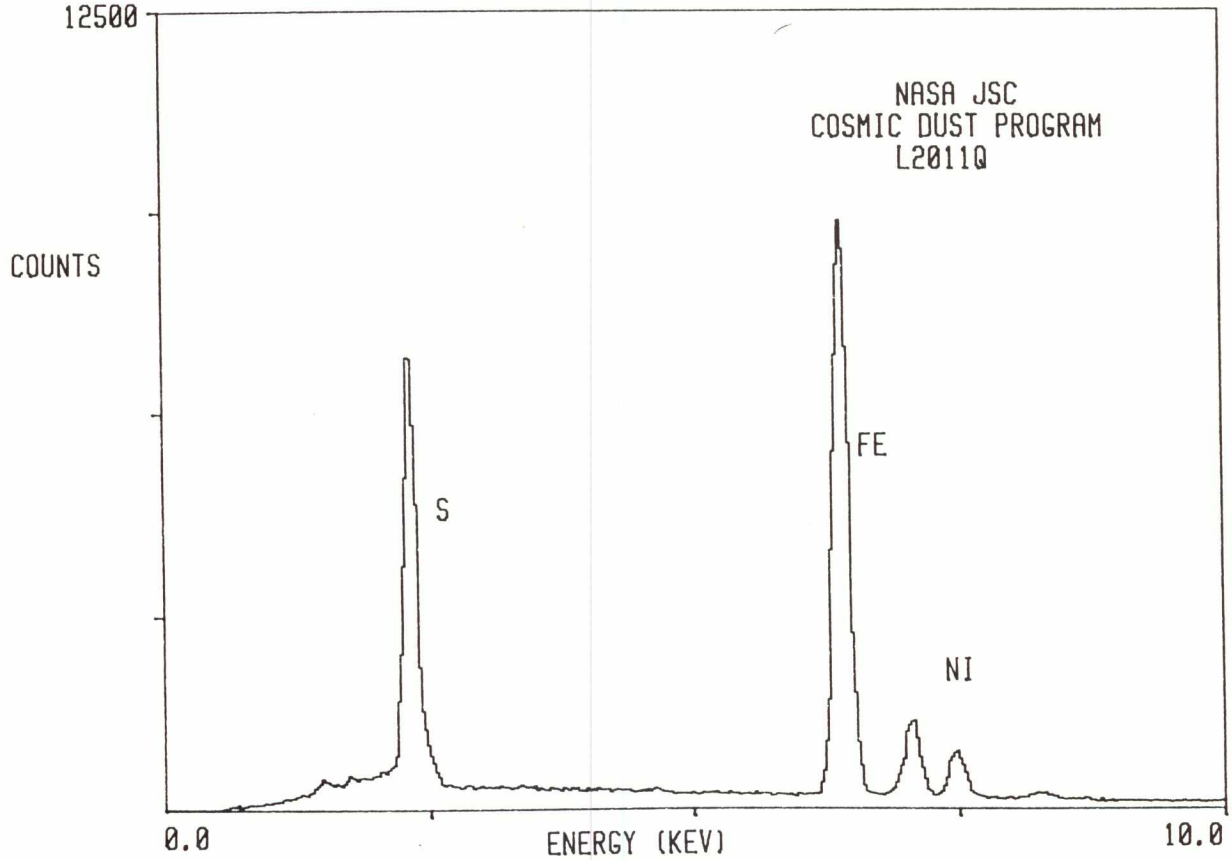
L2011 Q 12



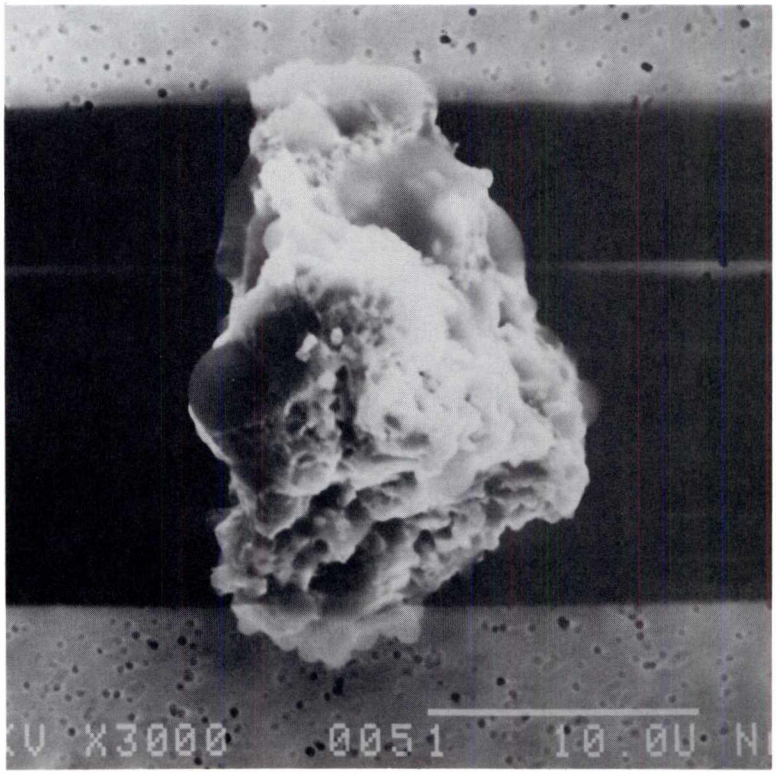
S-92-35259

SIZE: 12
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



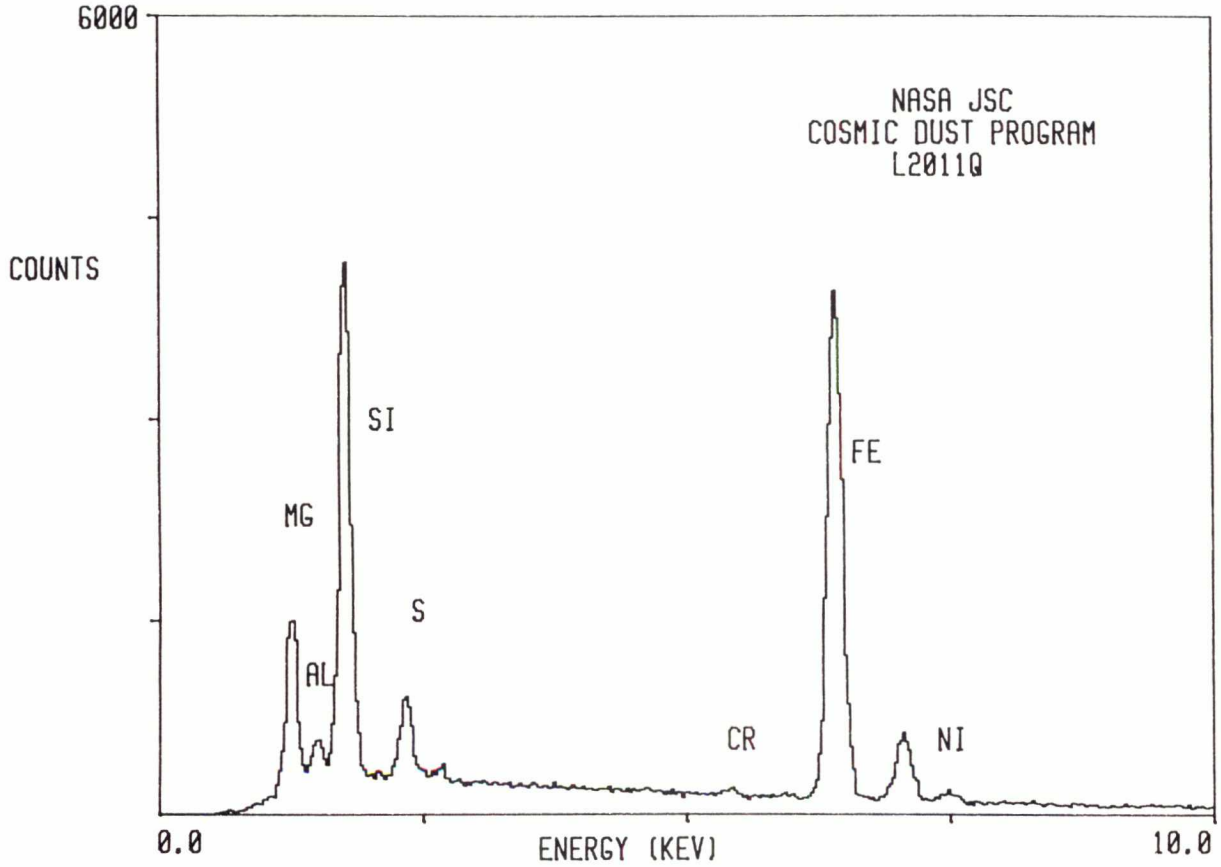
L2011 Q 13



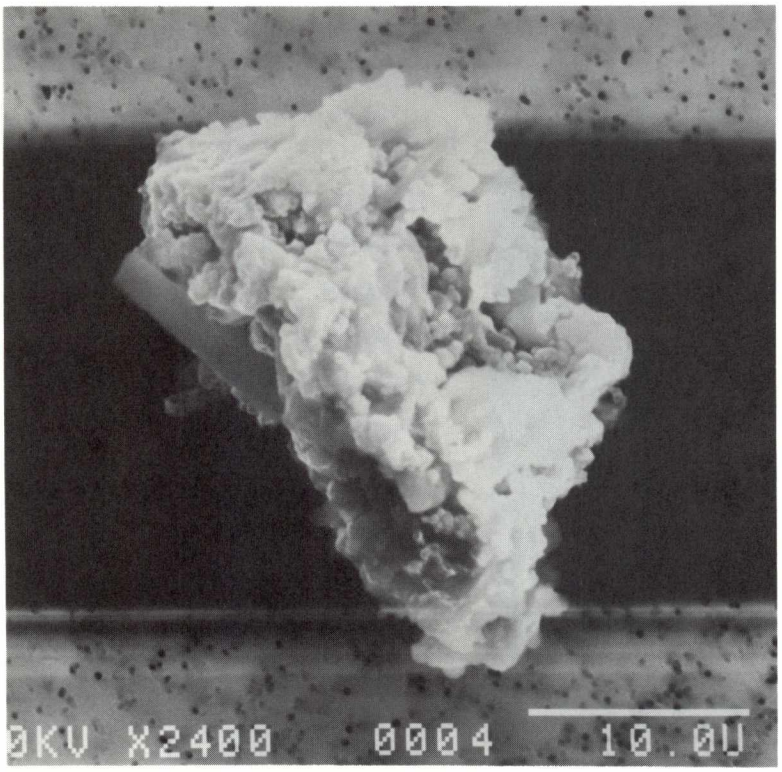
S-92-35260

SIZE: 22x15
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



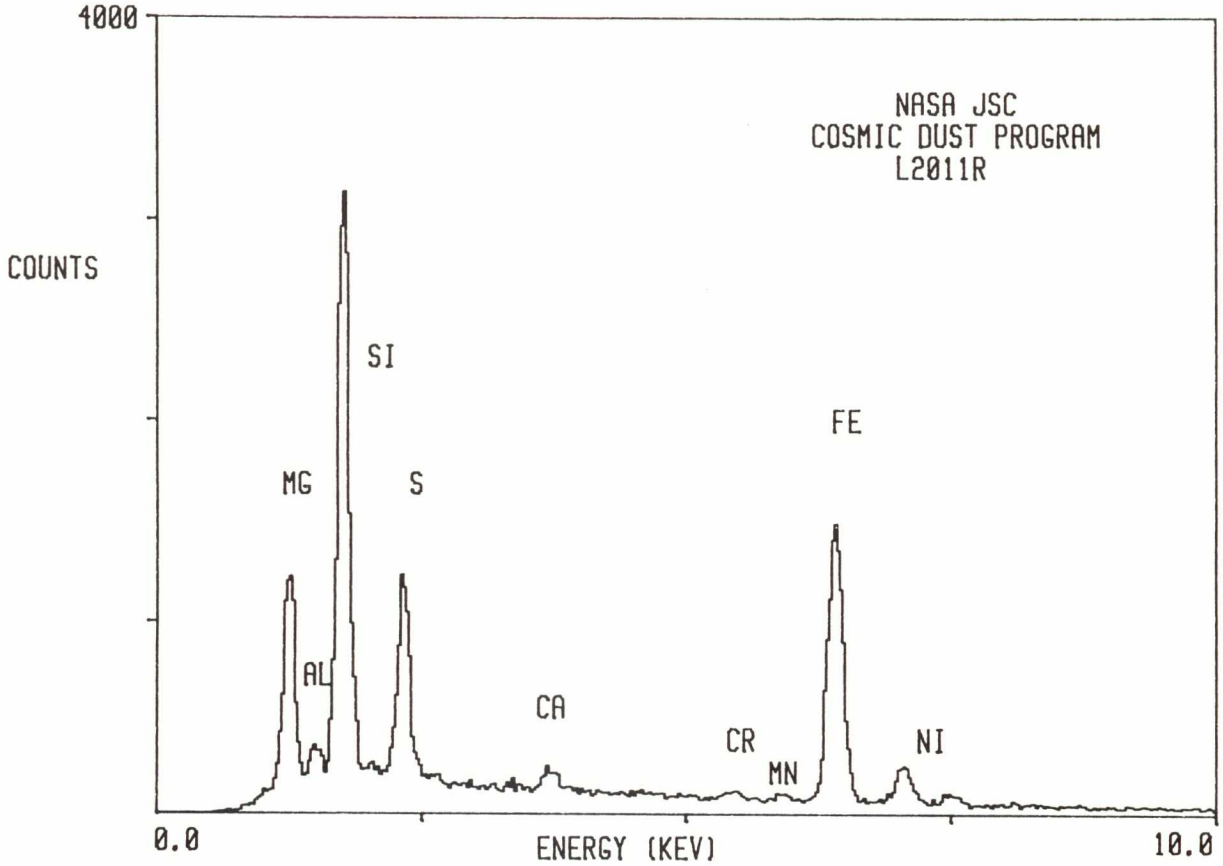
L2011 R 1



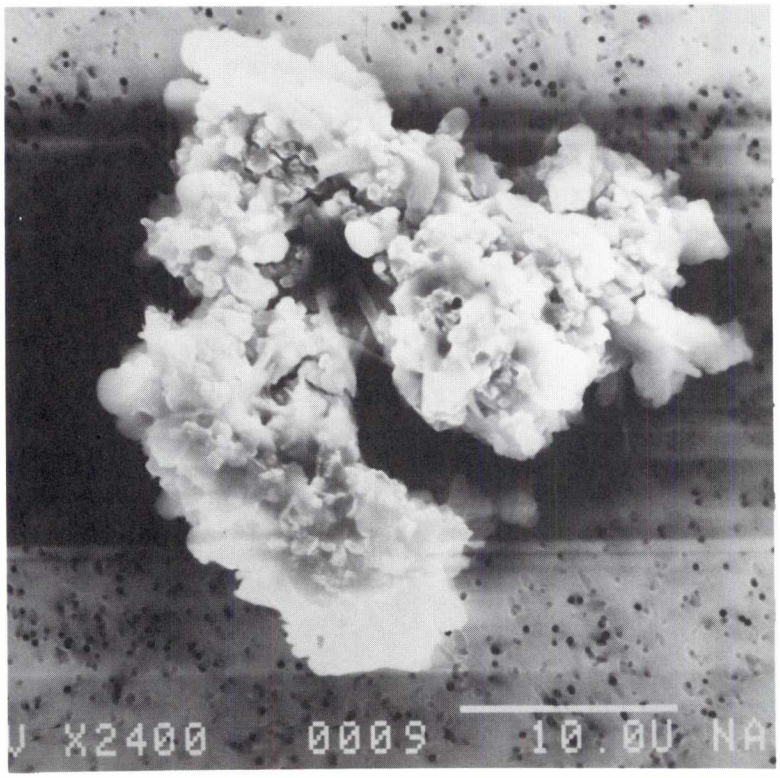
S-92-35234

SIZE: 29x22
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: SM
TYPE: C

COMMENTS:



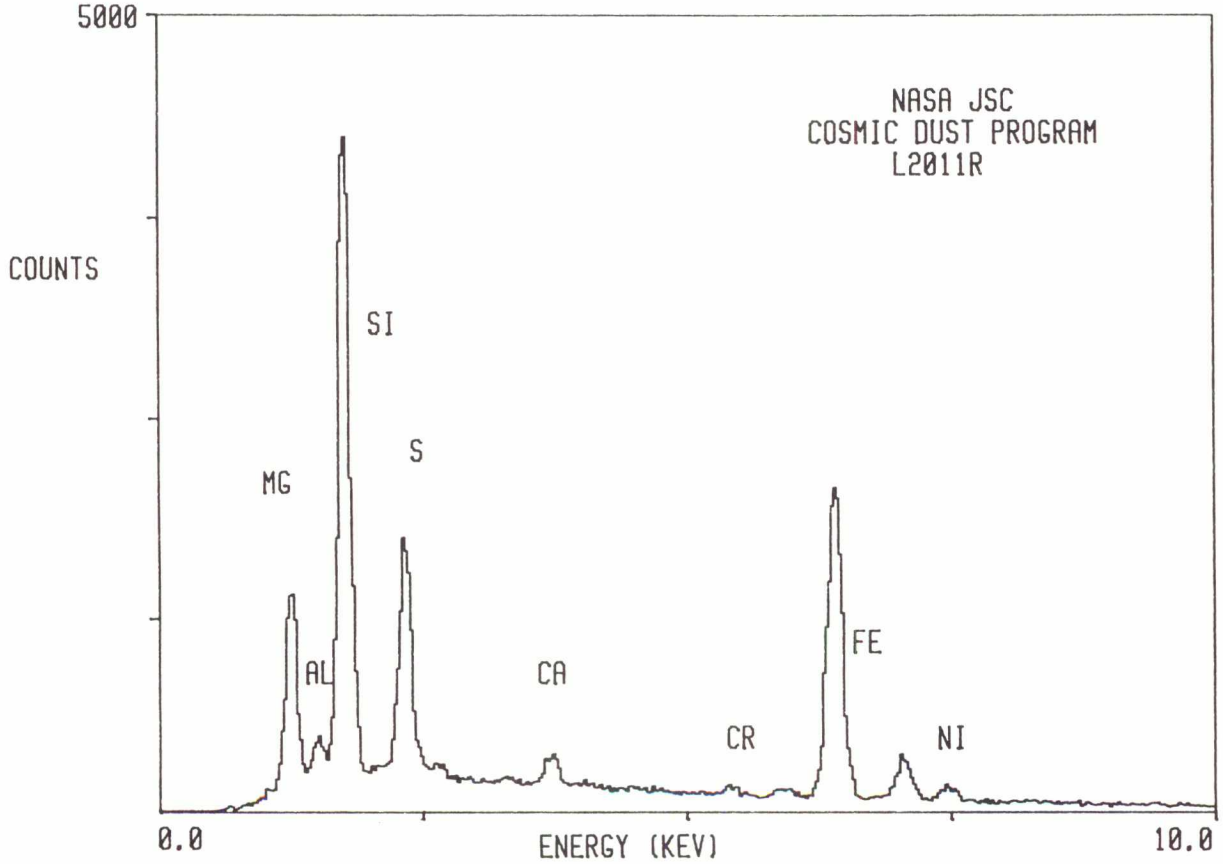
L2011 R 3



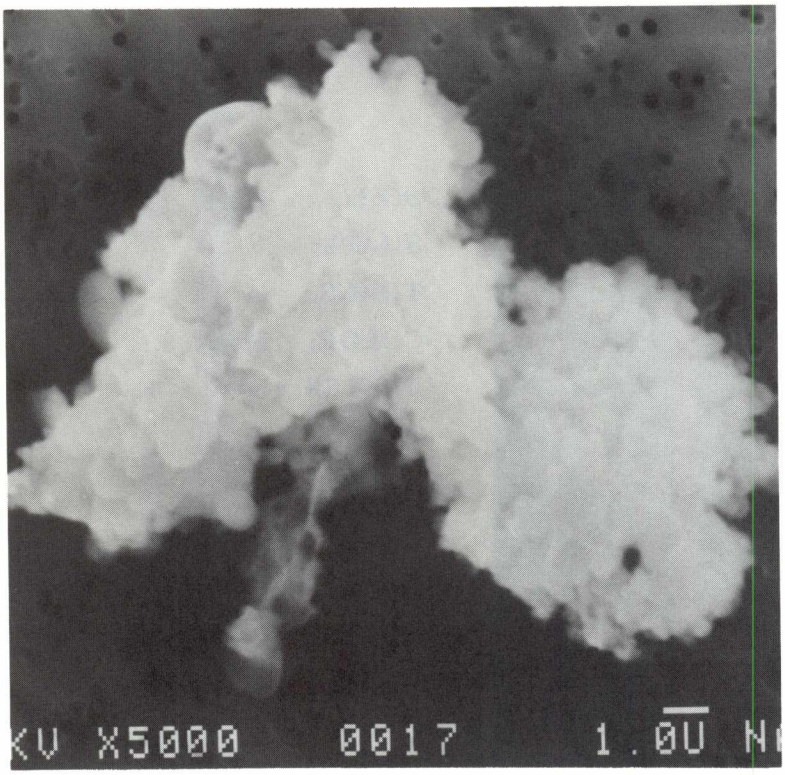
S-92-35236

SIZE: 33
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: SM
TYPE: C

COMMENTS:



L2011 R 7



S-92-35240

SIZE: 18x13

SHAPE: I

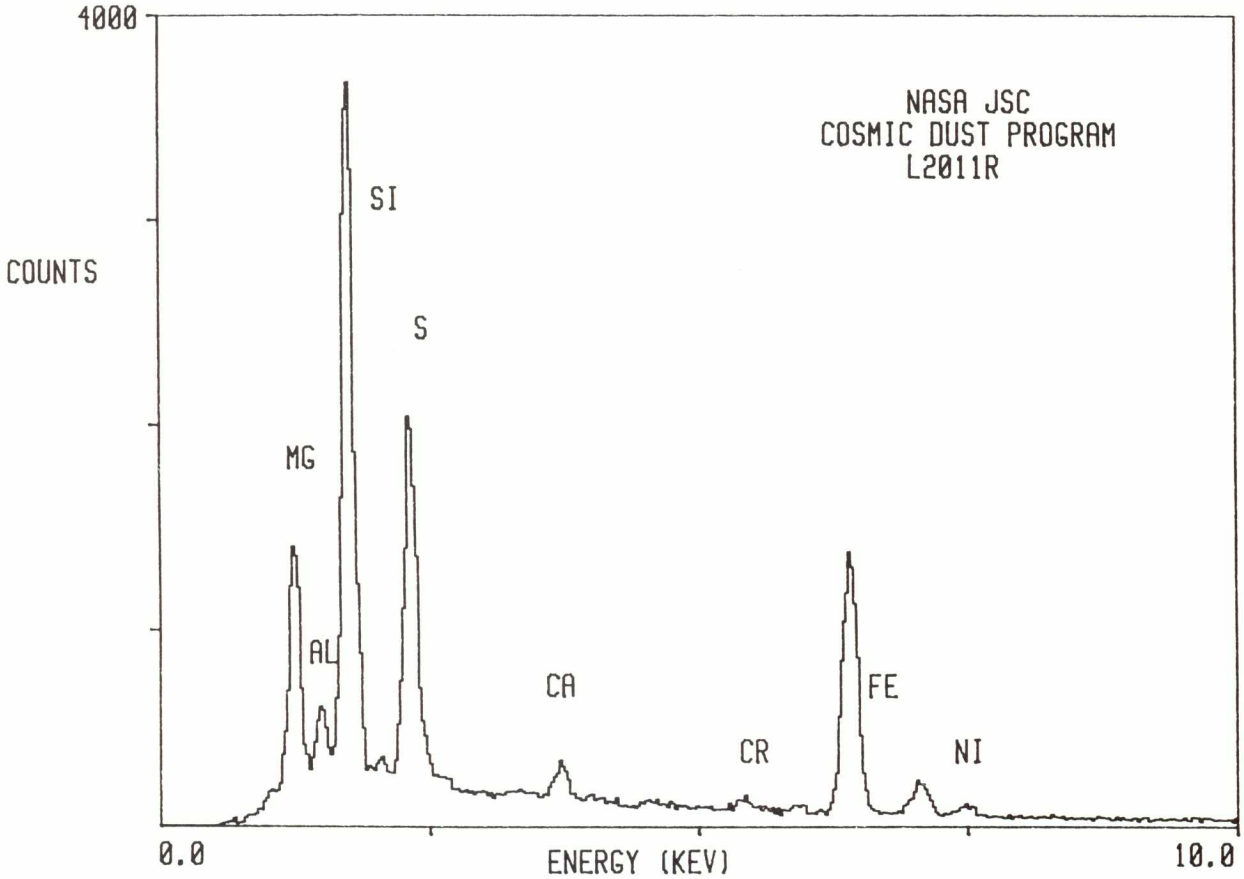
TRANS.: O

COLOR: Black to White

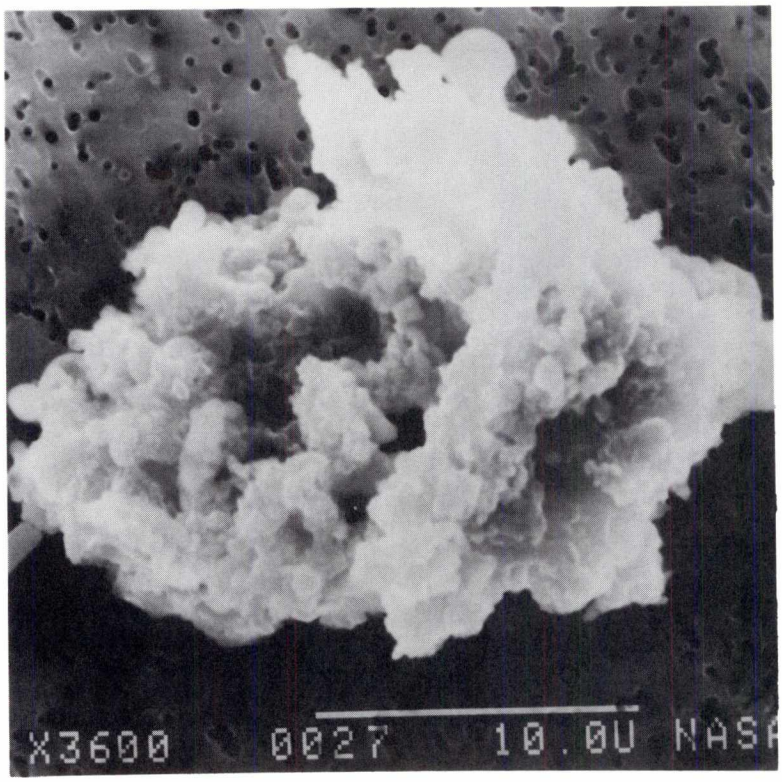
LUSTER: D

TYPE: C

COMMENTS:



L2011 R 11



S-92-35244

SIZE: 25x17

SHAPE: I

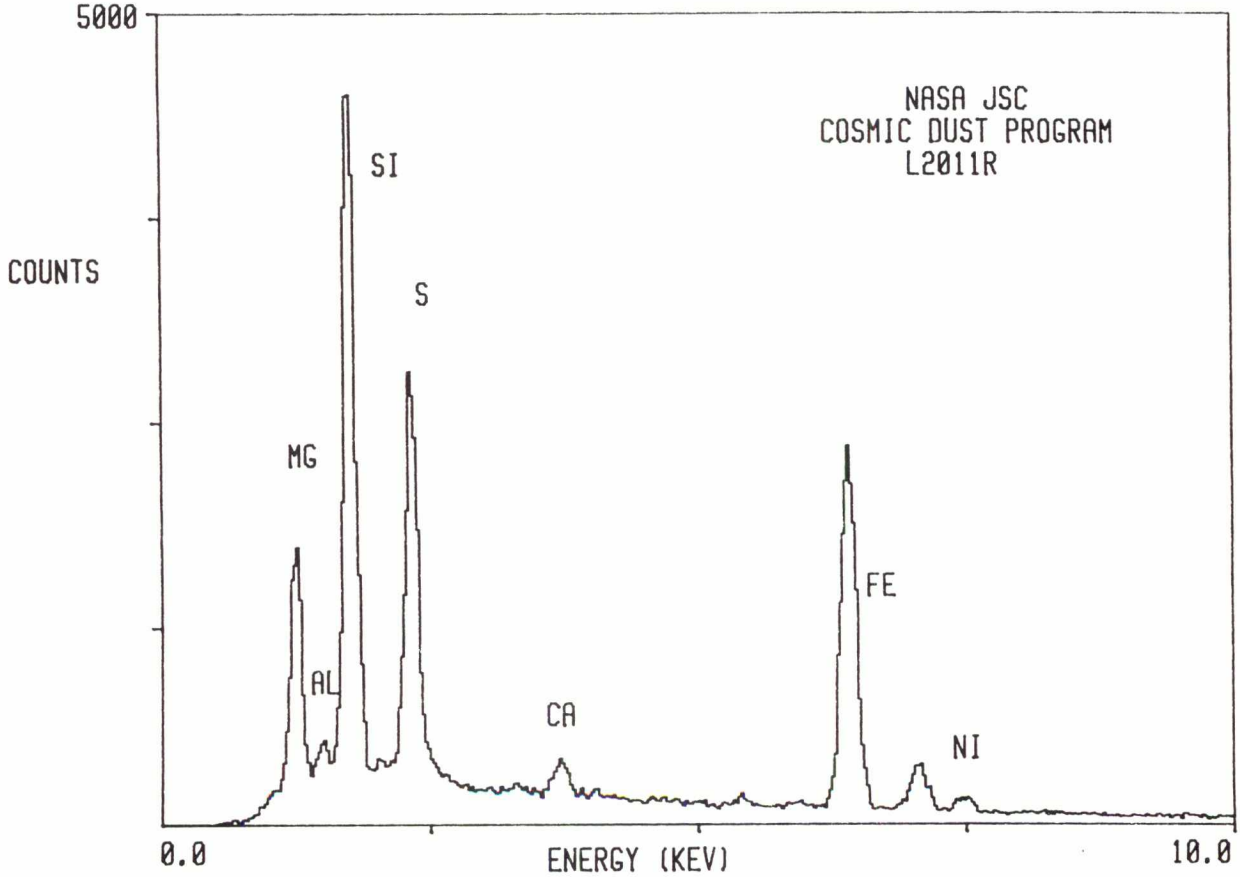
TRANS.: O

COLOR: Black

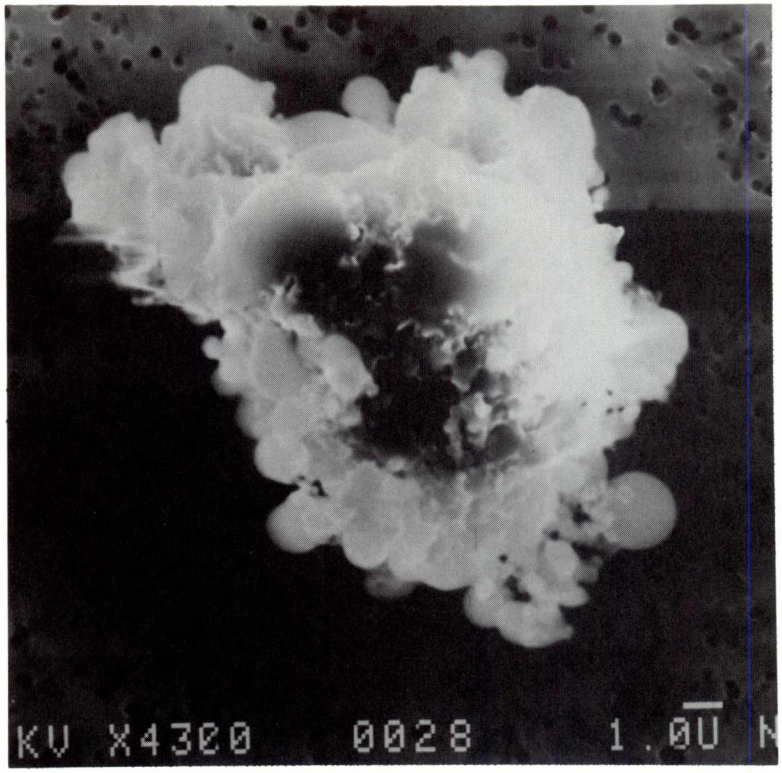
LUSTER: D

TYPE: C

COMMENTS:



L2011 R 12



S-92-35245

SIZE: 19x17

SHAPE: I

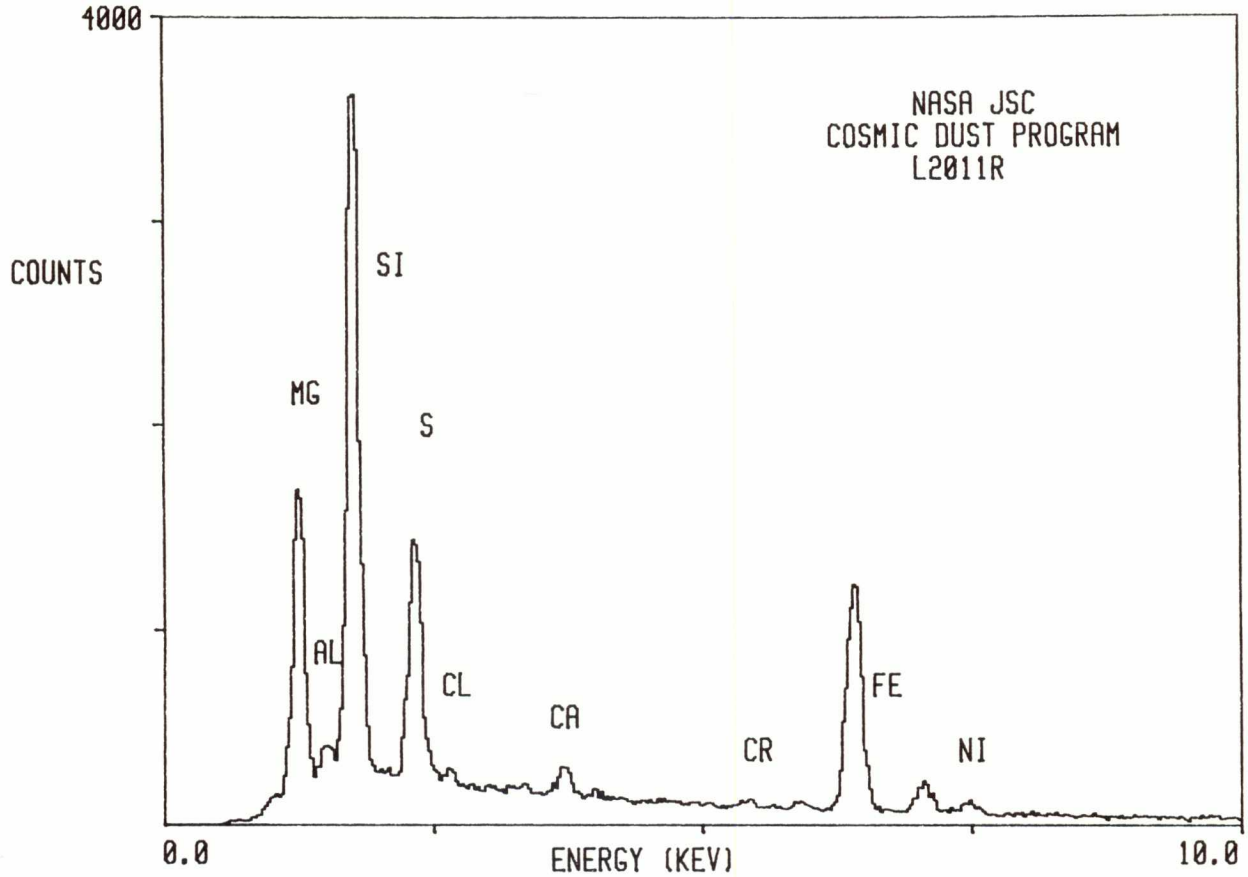
TRANS.: O

COLOR: Black to Brown

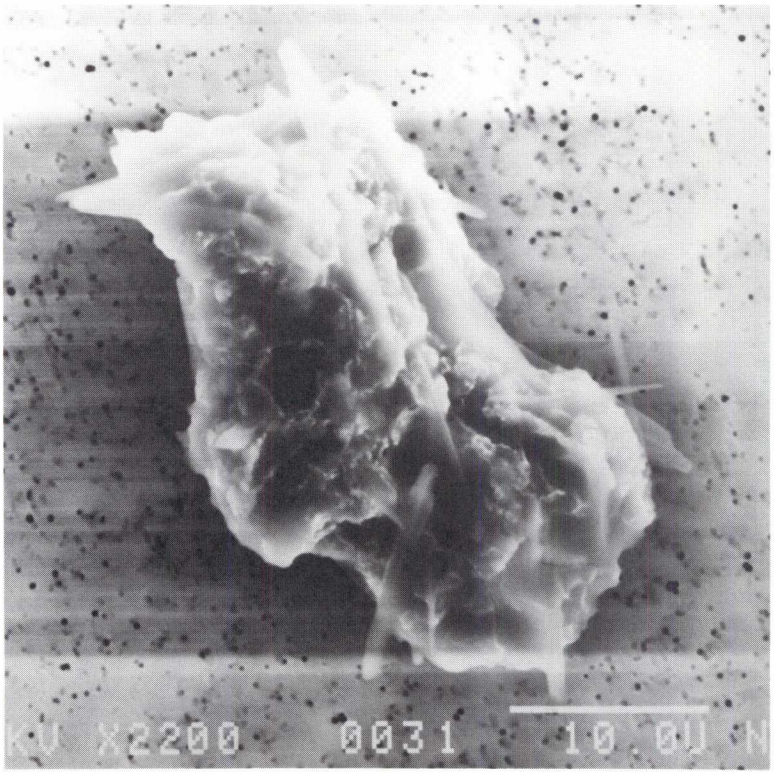
LUSTER: SM

TYPE: C

COMMENTS:



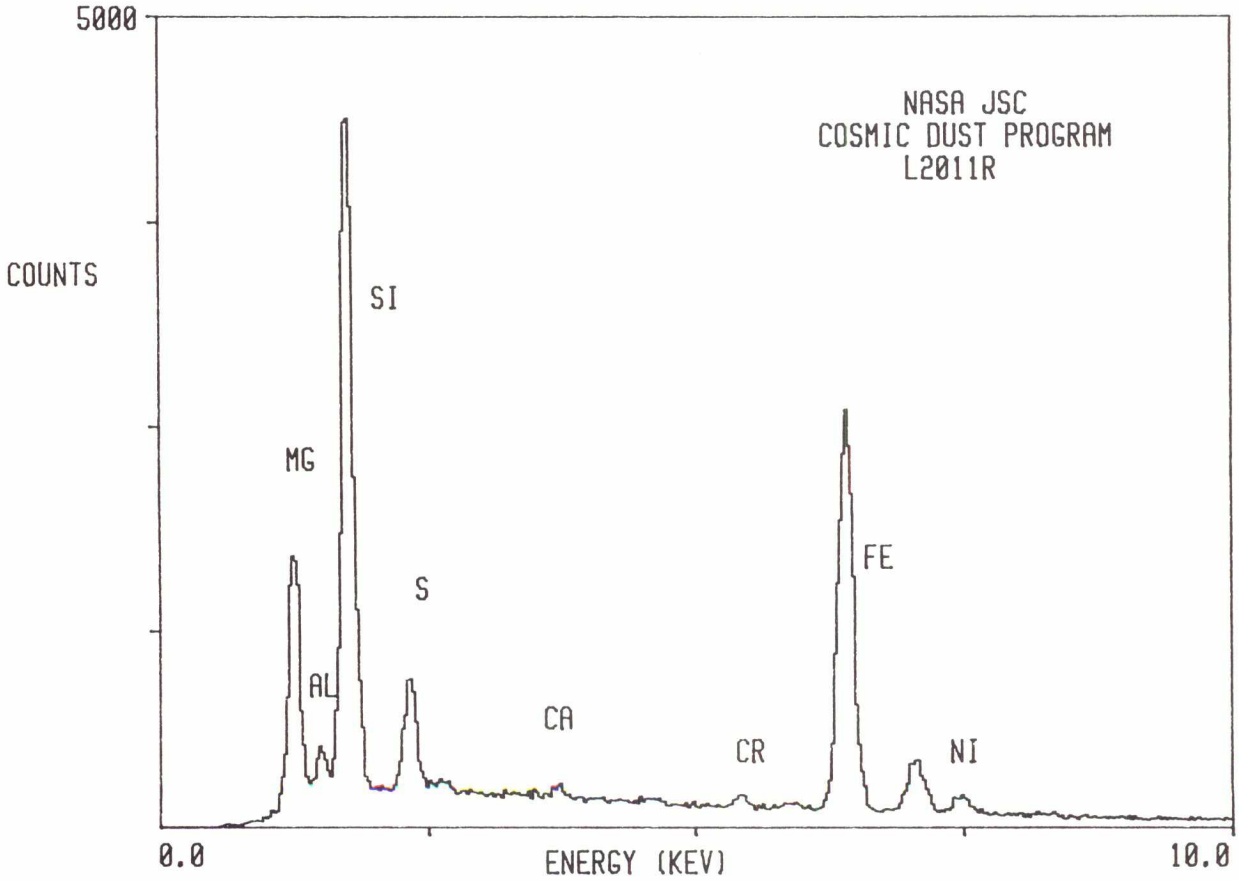
L2011 R 13



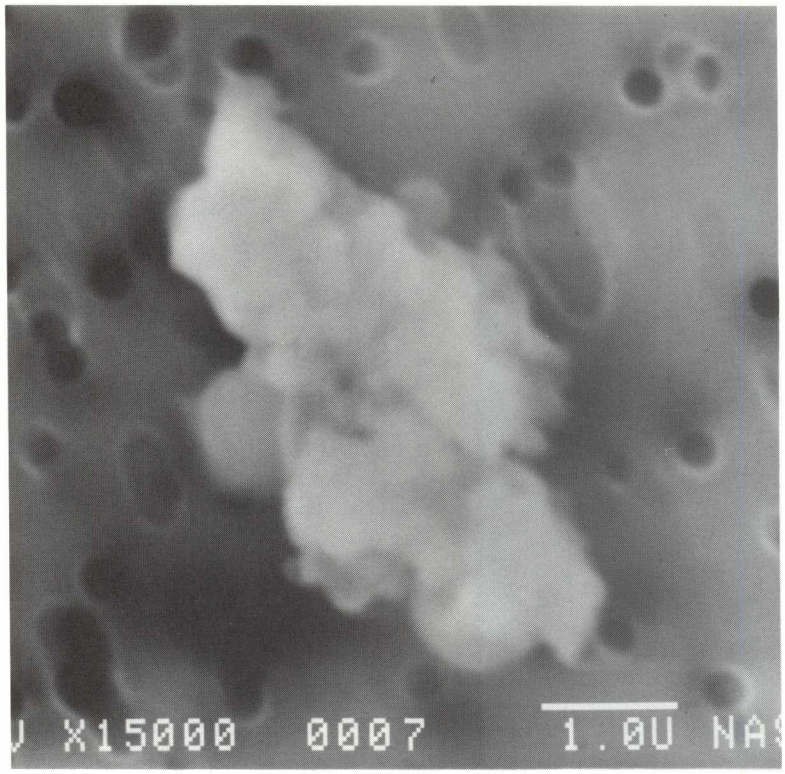
S-92-35246

SIZE: 35x22
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



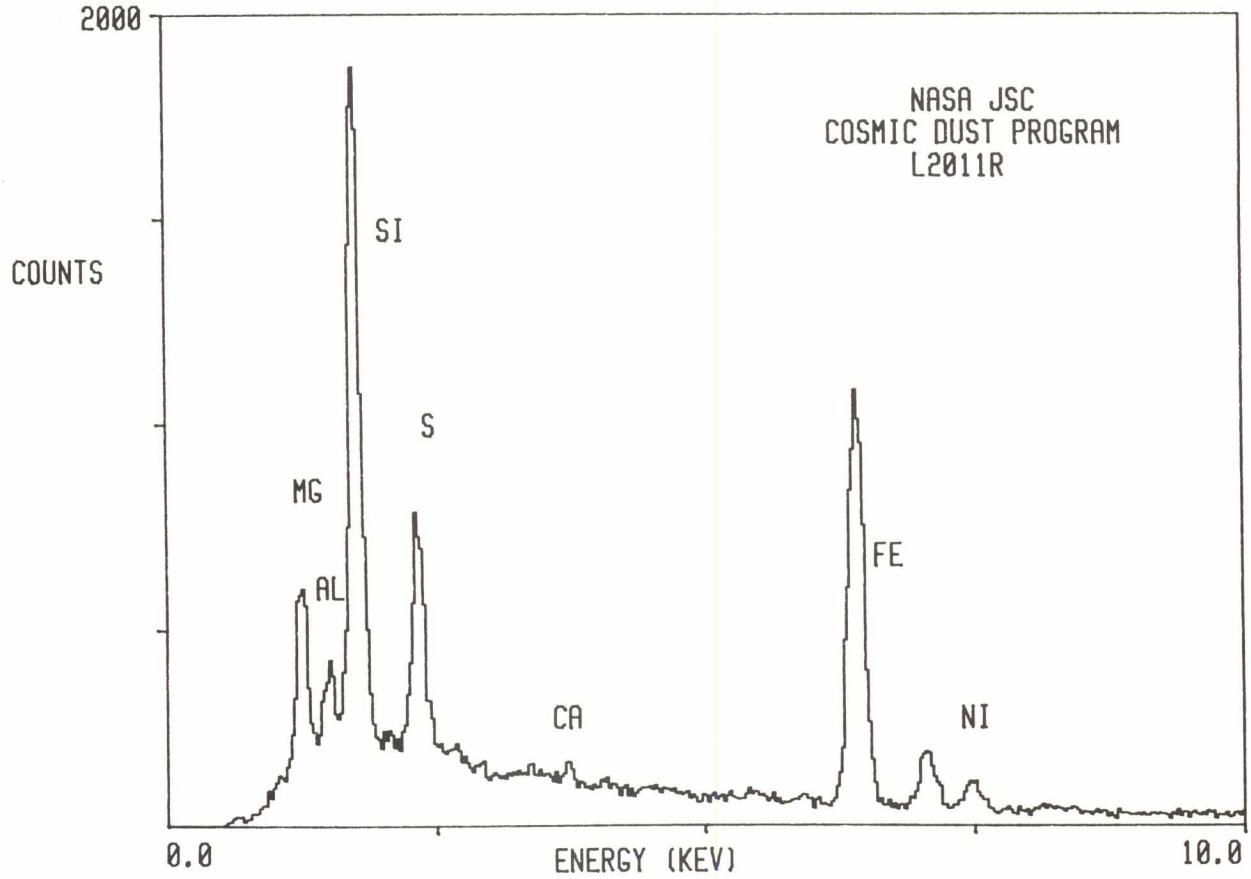
L2011 R 14



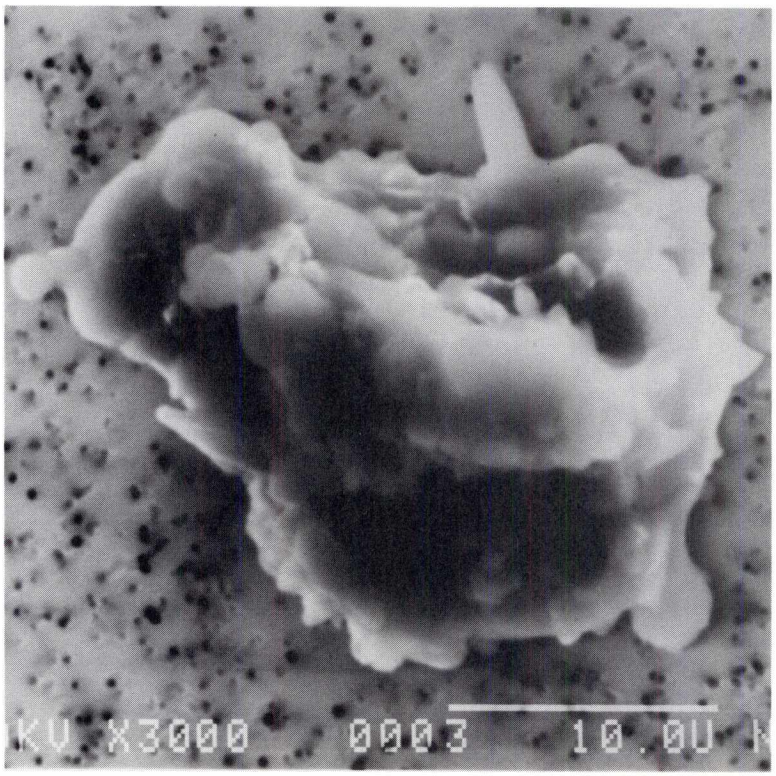
S-92-35247

SIZE: 5x3
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



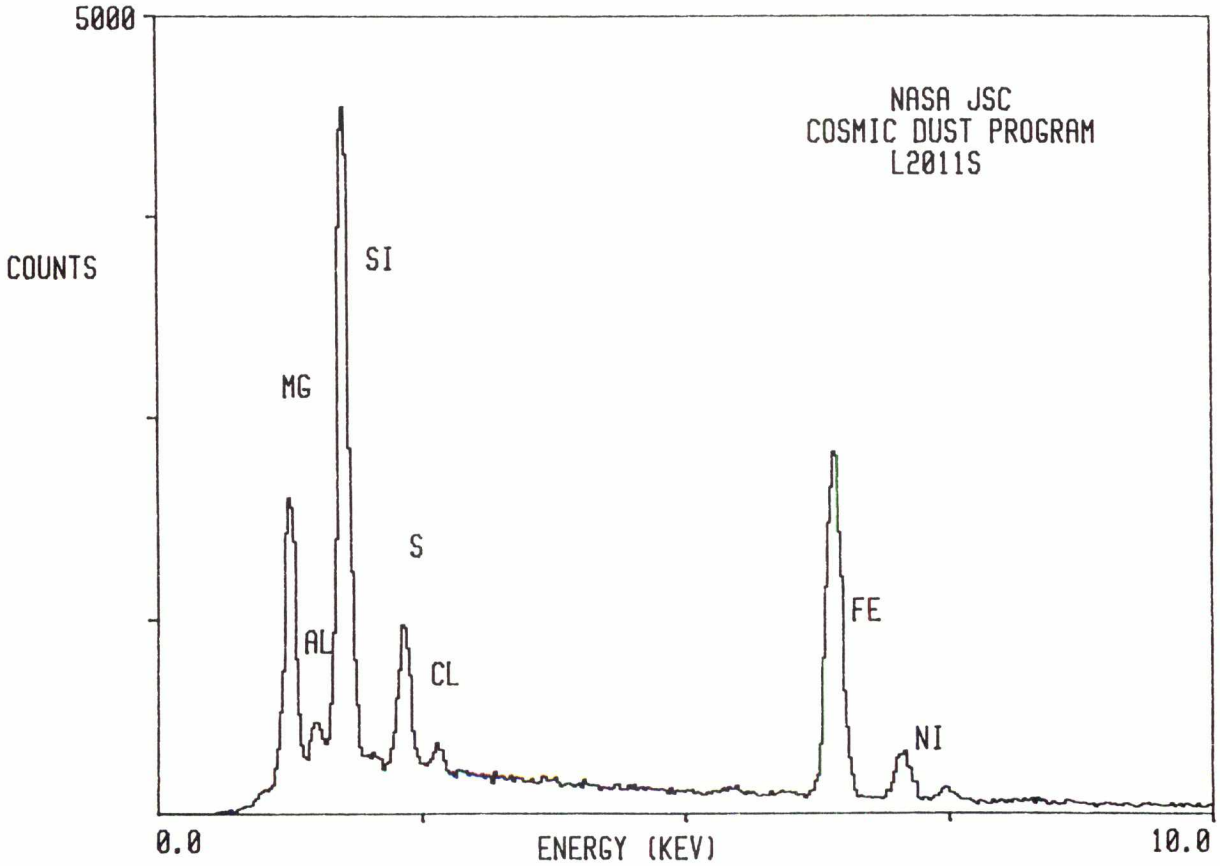
L2011 S 2



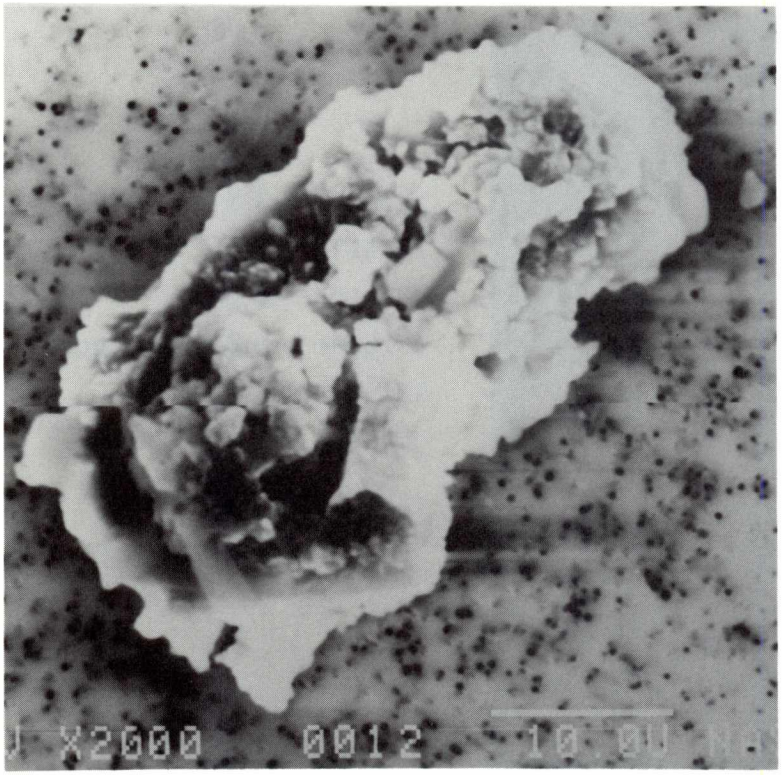
S-92-35221

SIZE: 26x22
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: SM
TYPE: C

COMMENTS:



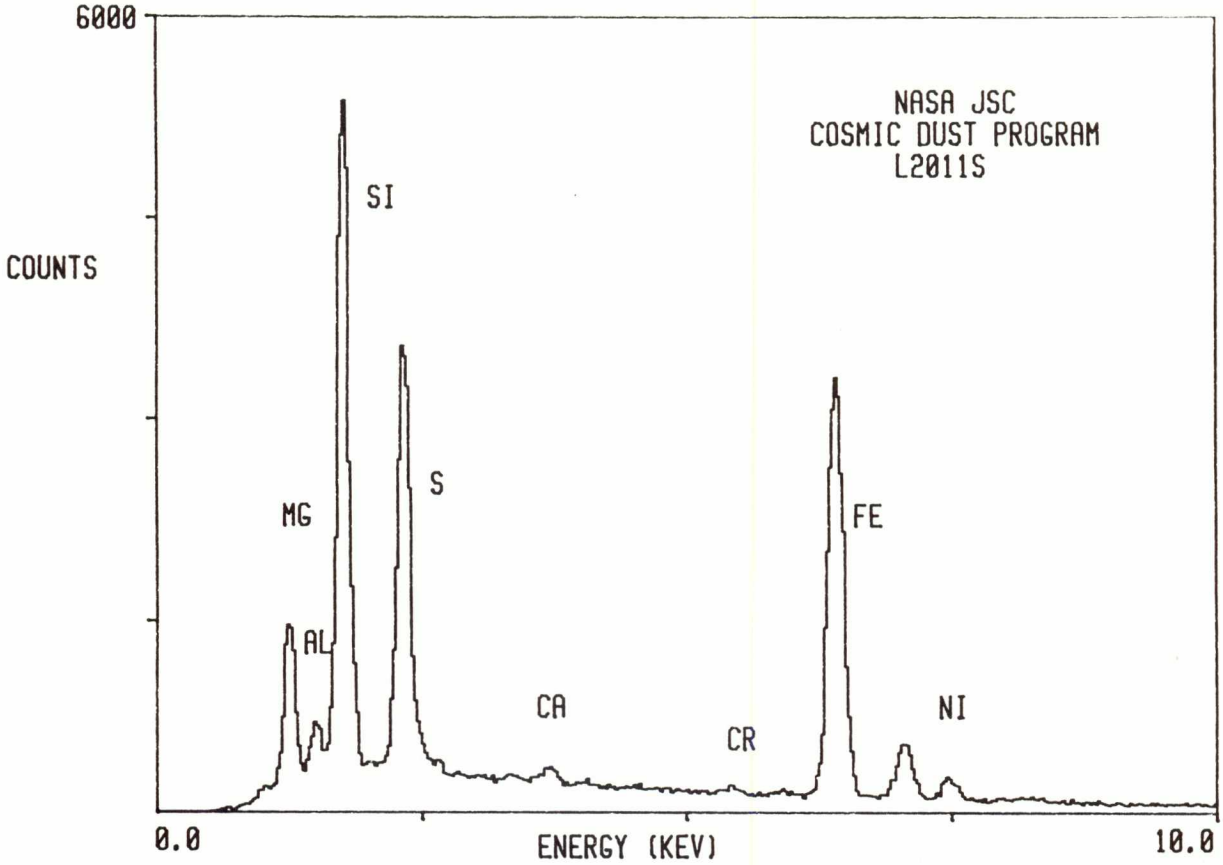
L2011 S 4



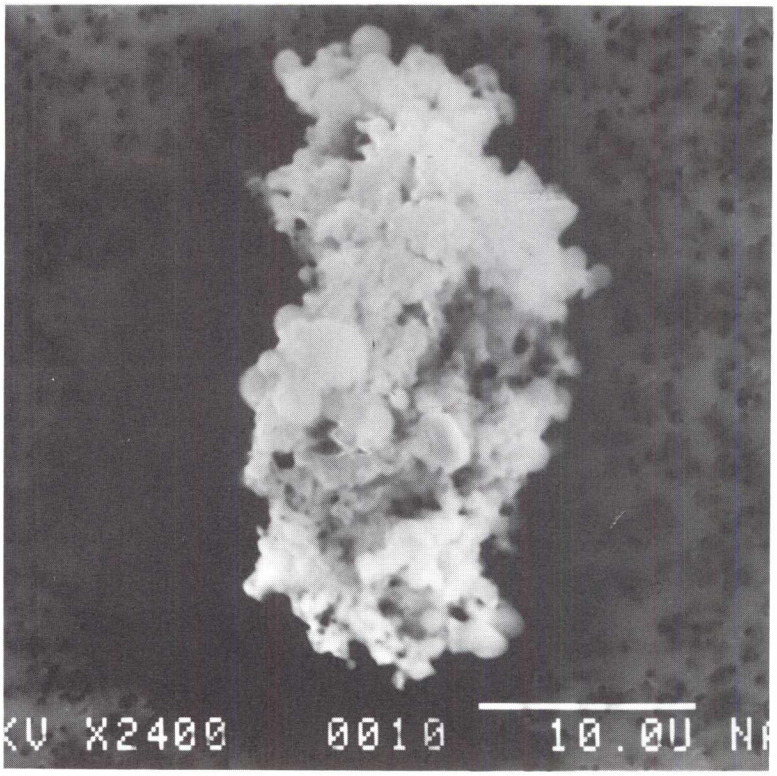
S-92-35223

SIZE: 42x22
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: C

COMMENTS:



L2011 S 5



S-92-35224

SIZE: 32x15

SHAPE: E

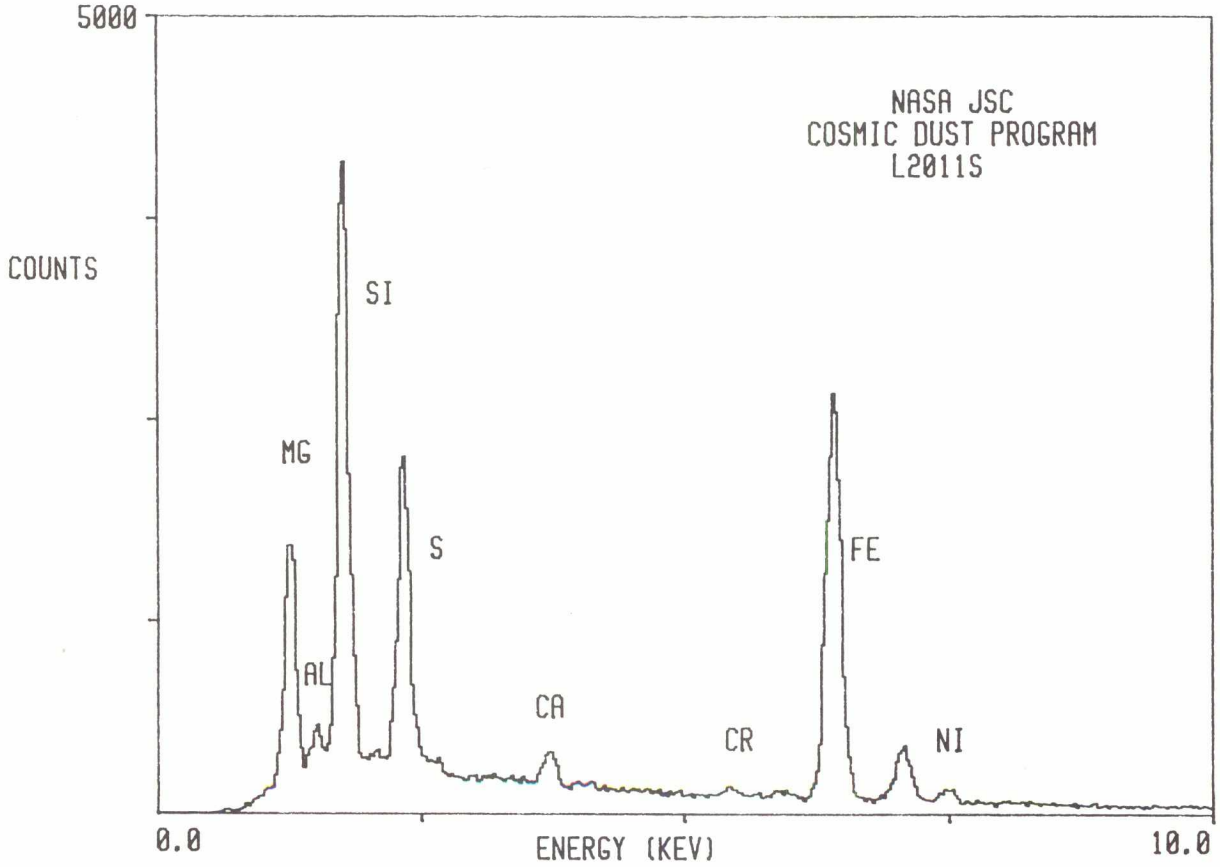
TRANS.: O

COLOR: Brown to Black

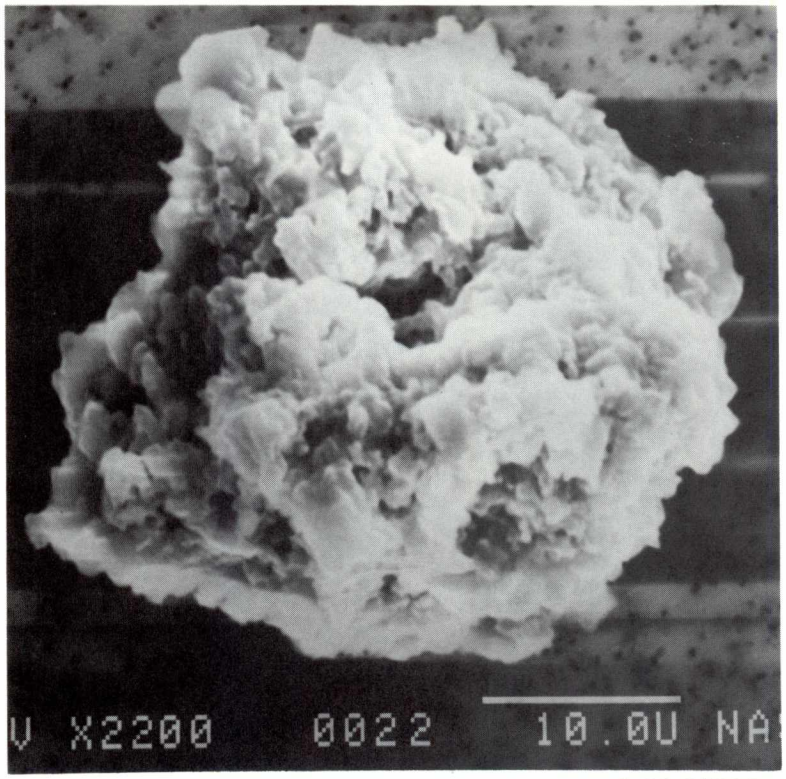
LUSTER: R

TYPE: C

COMMENTS:



L2011 S 8



S-92-35227

SIZE: 35x33

SHAPE: E

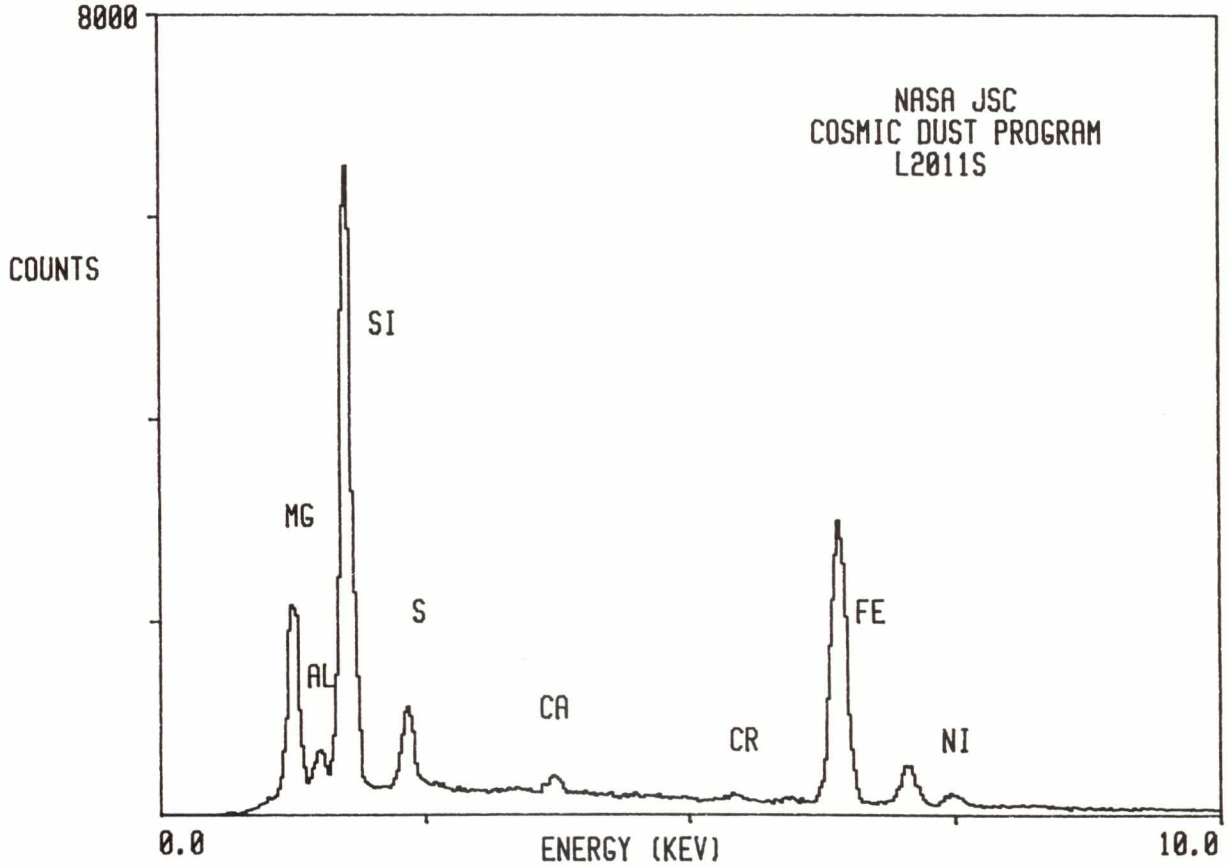
TRANS.: O

COLOR: Brown to Black

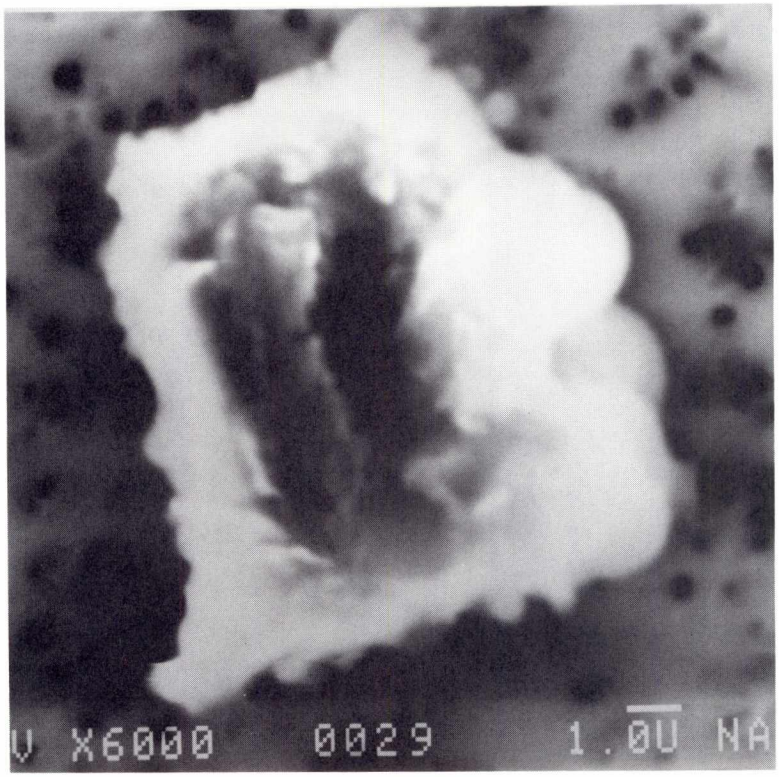
LUSTER: SM

TYPE: C

COMMENTS:



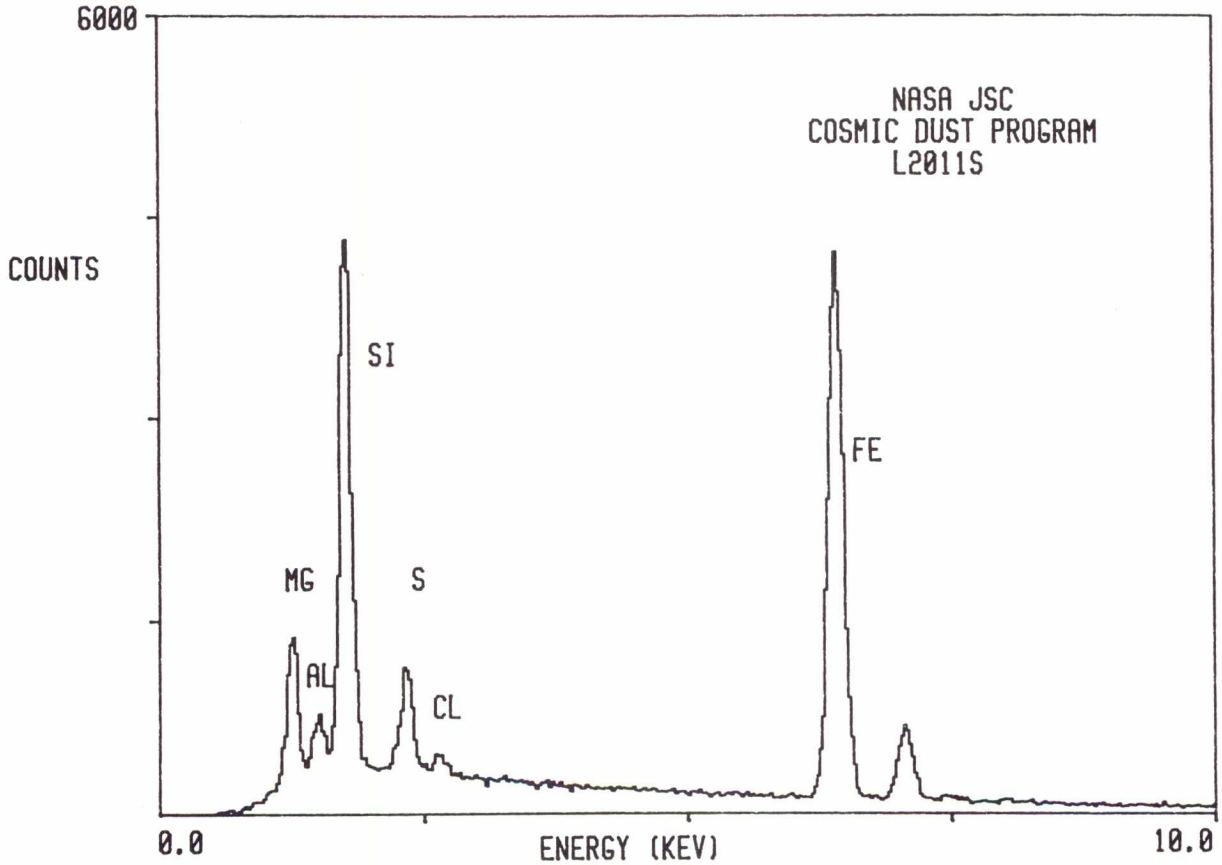
L2011 S 12



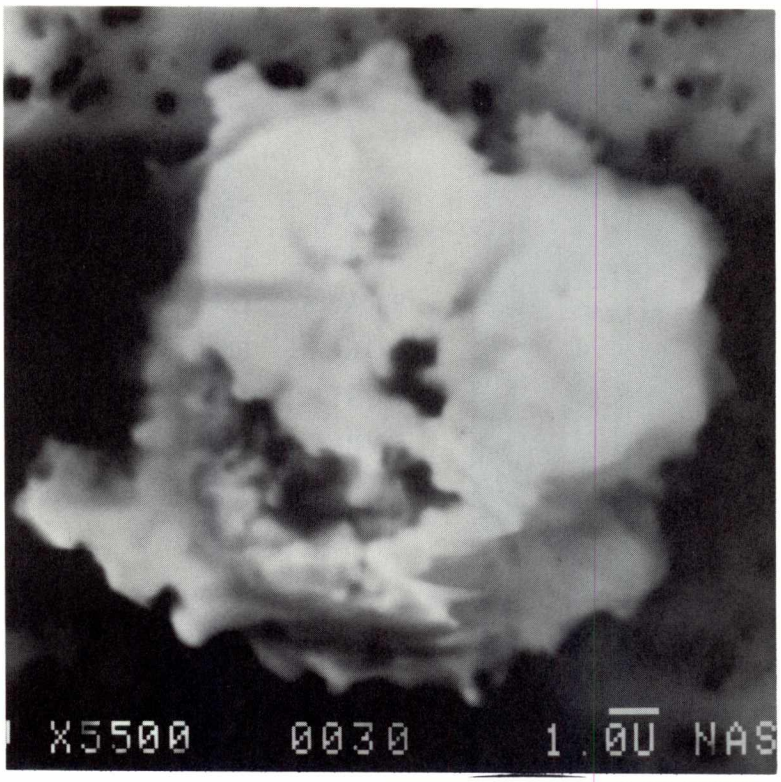
S-92-35231

SIZE: 13x11
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C

COMMENTS:



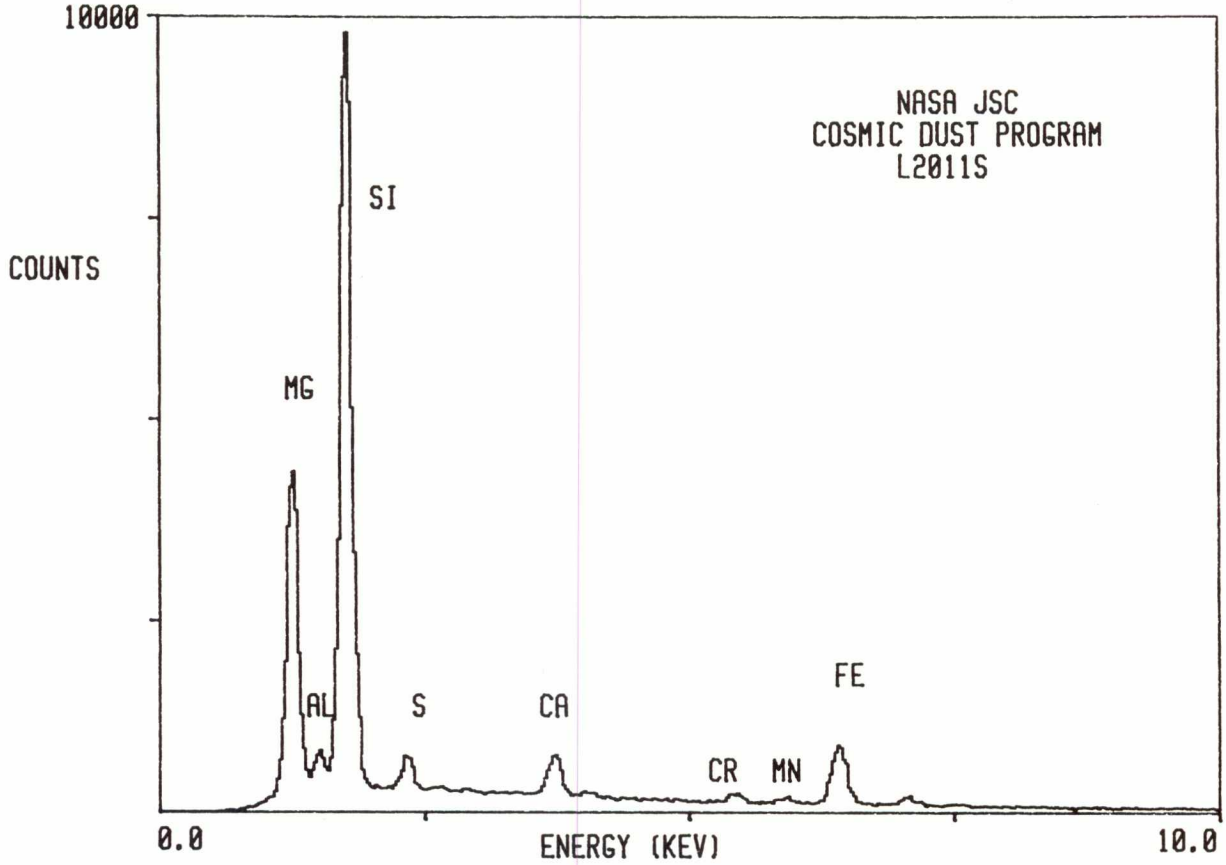
L2011 S 13



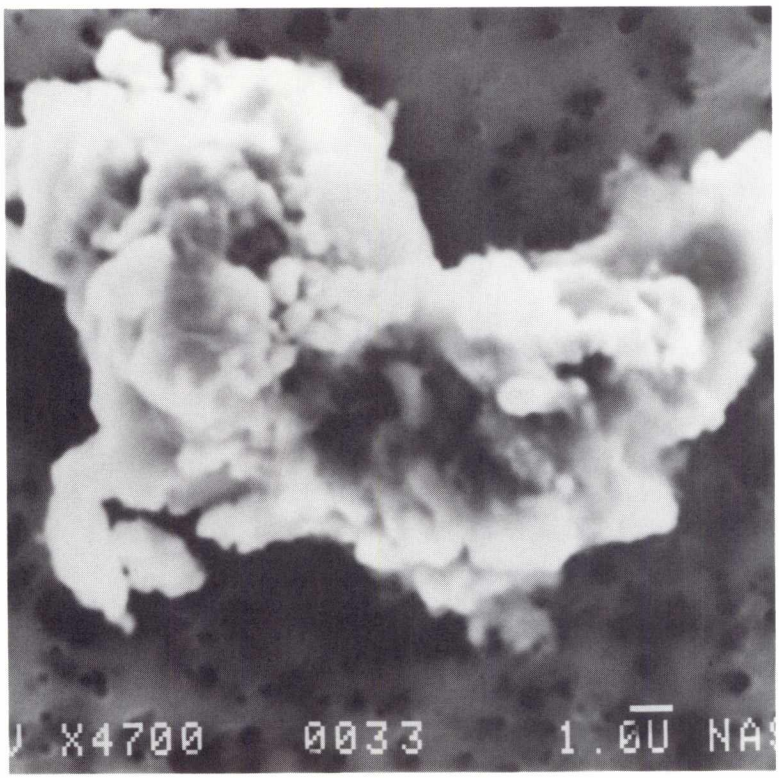
S-92-35232

SIZE: 14x12
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



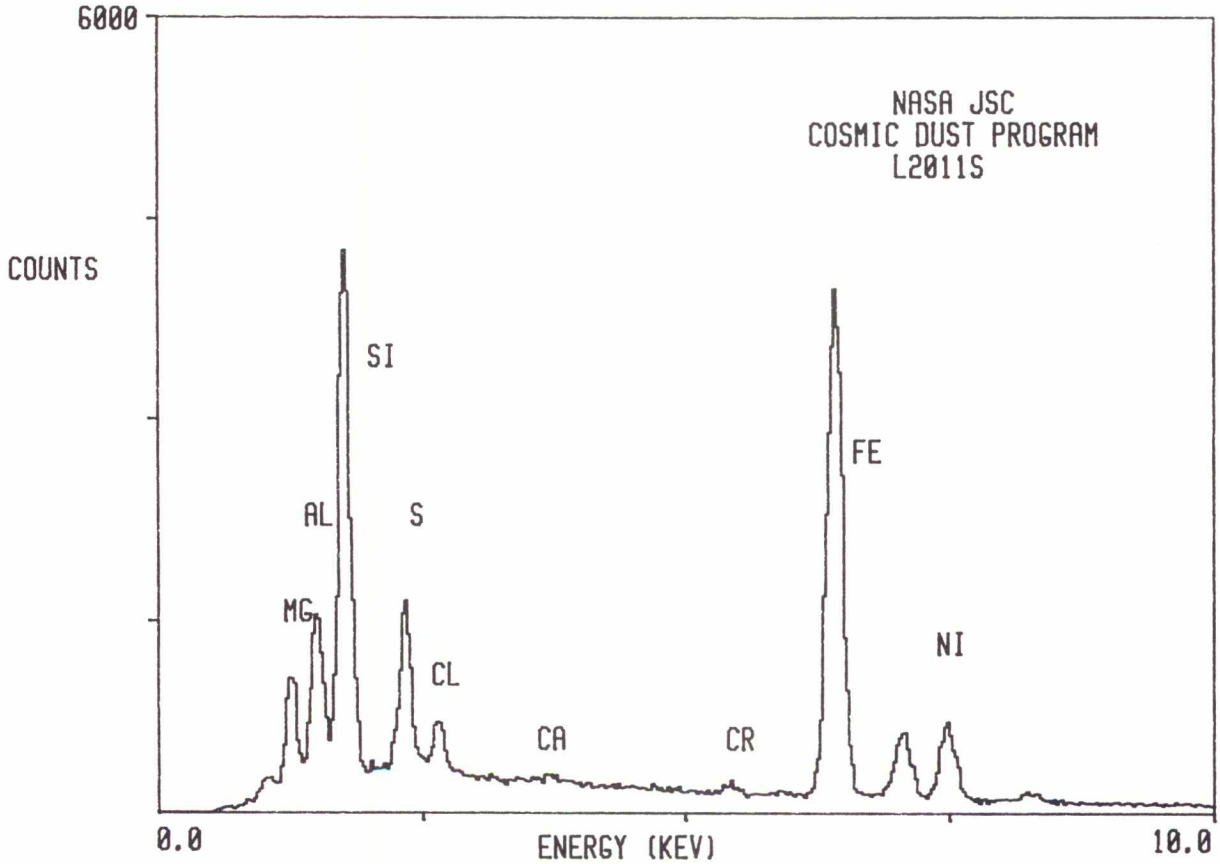
L2011 S 14



S-92-35233

SIZE: 20x11
SHAPE: I
TRANS.: O
COLOR: Red to Black
LUSTER: M
TYPE: C

COMMENTS:

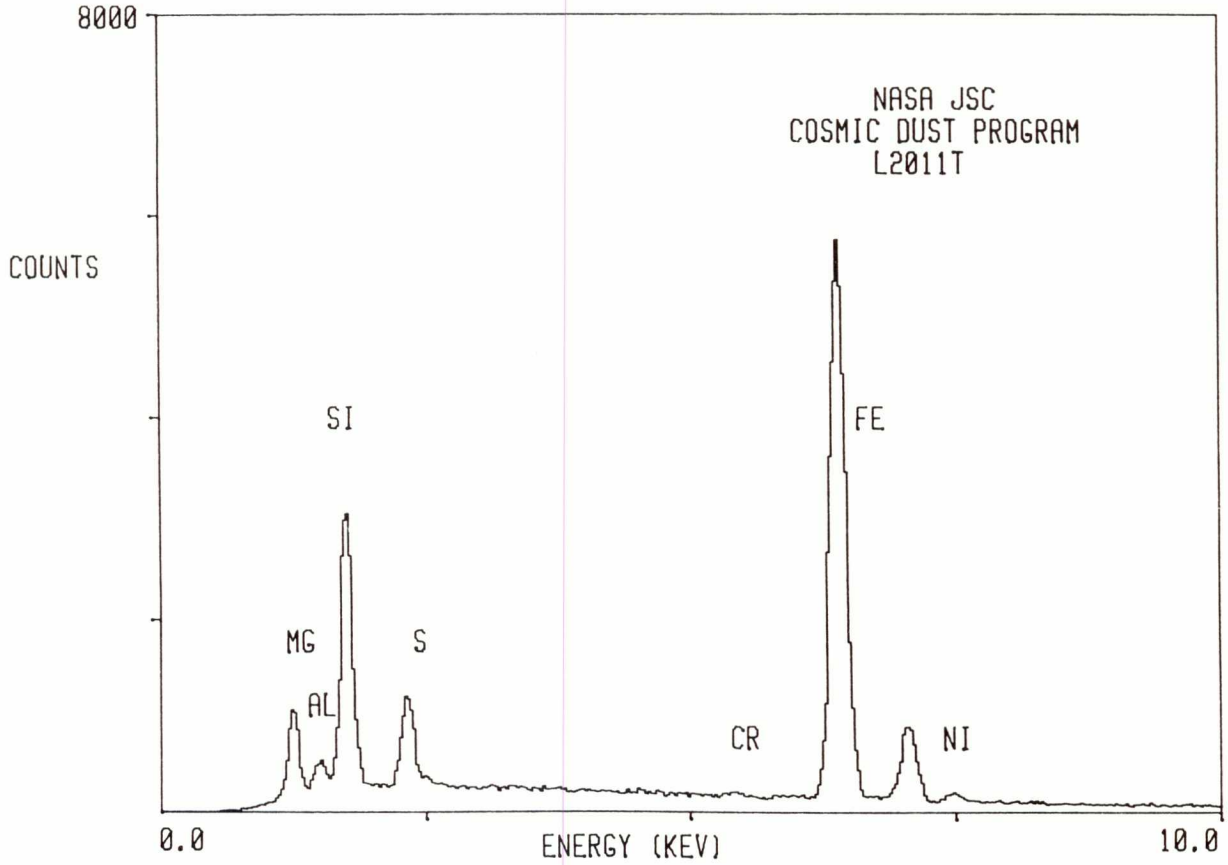


L2011 T 2

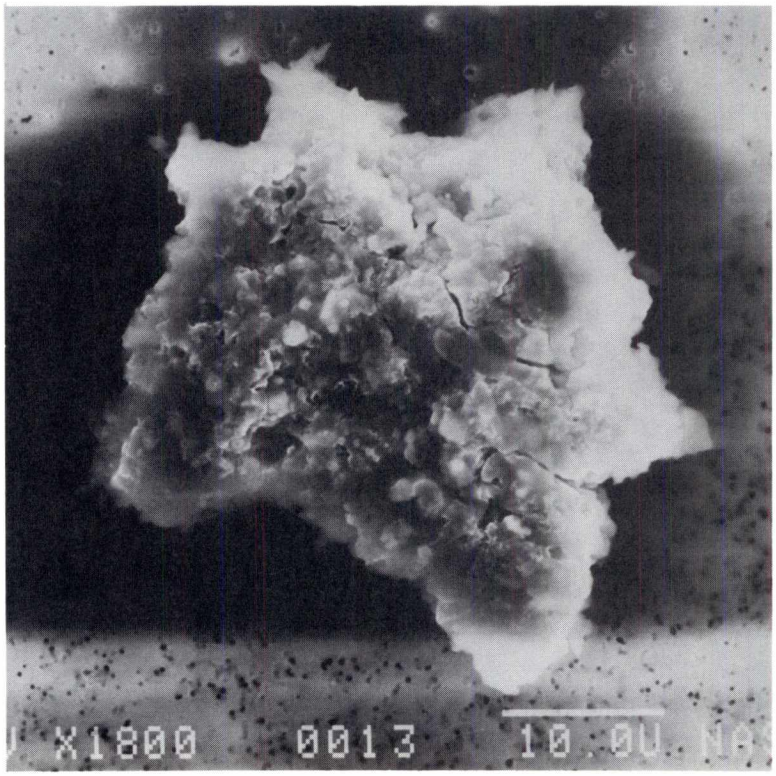
S-92-35959

SIZE: 34x15
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: C

COMMENTS:



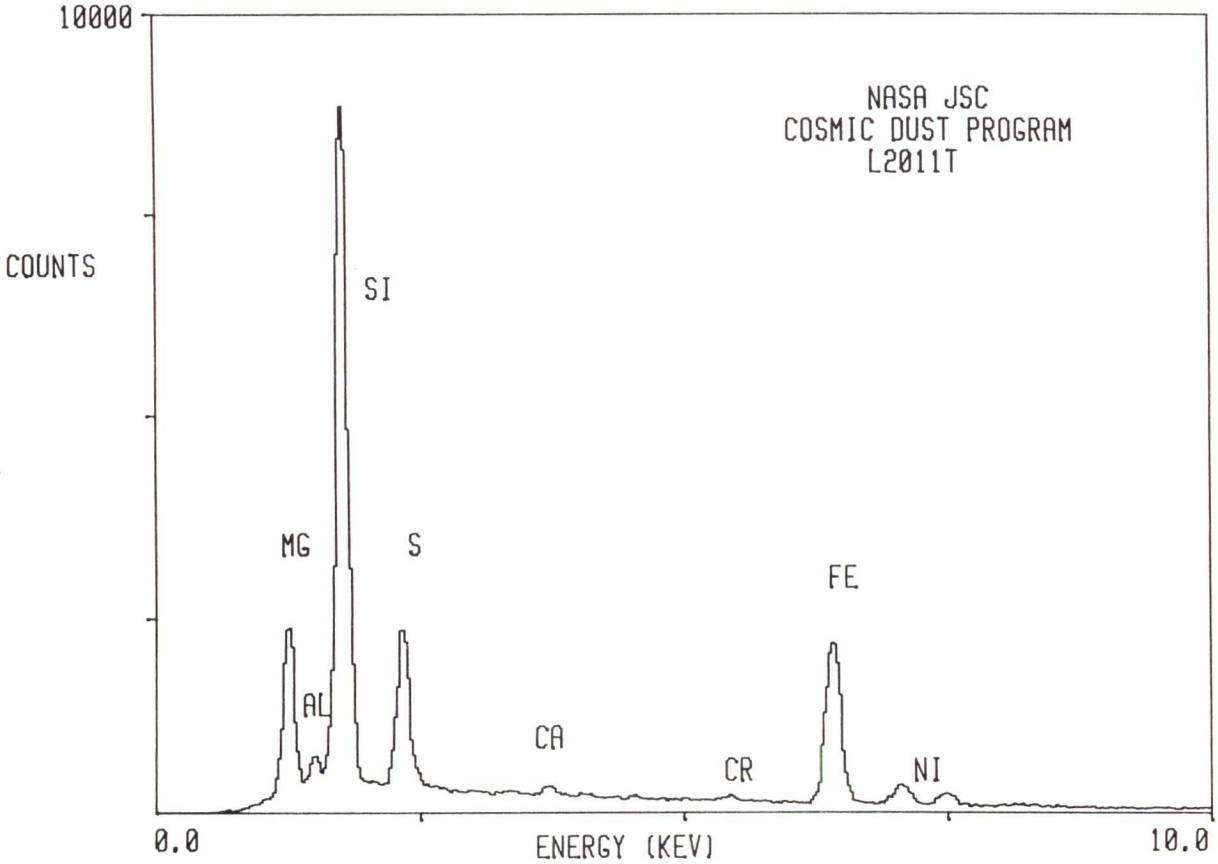
L2011 T 3



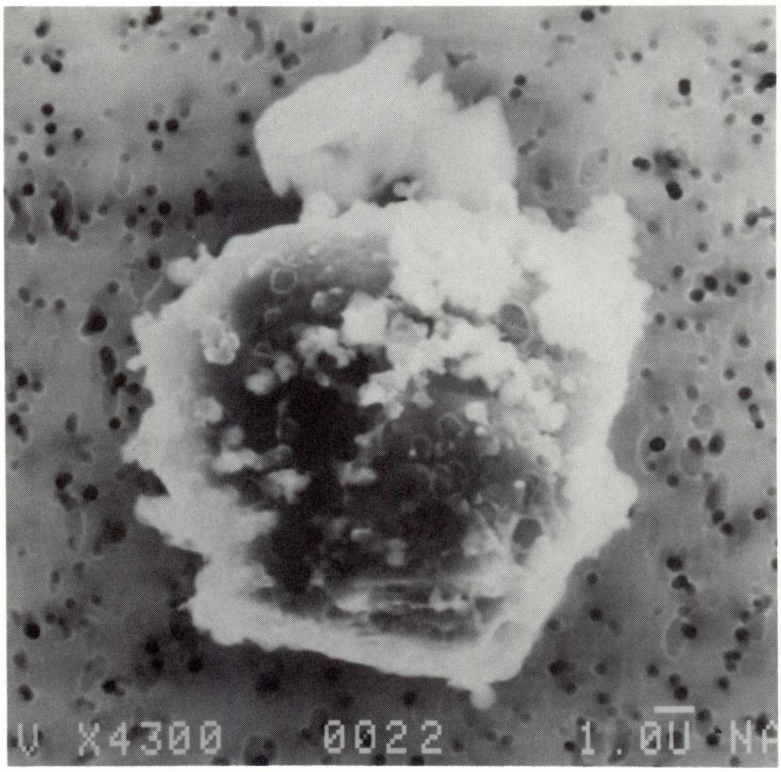
S-92-35960

SIZE: 37x33
SHAPE: E
TRANS.: O
COLOR: Brown
LUSTER: SM
TYPE: C

COMMENTS:



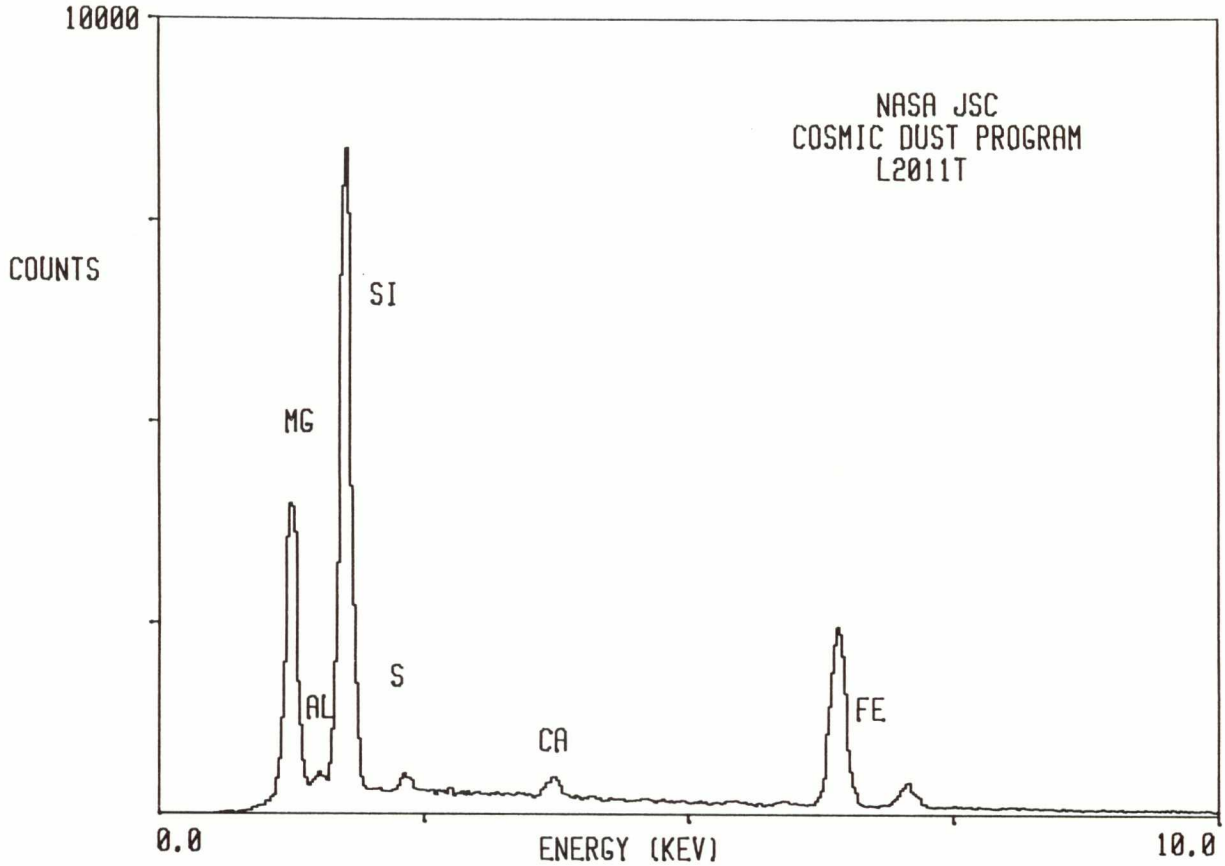
L2011 T 6



S-92-35963

SIZE: 13
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: SM
TYPE: C

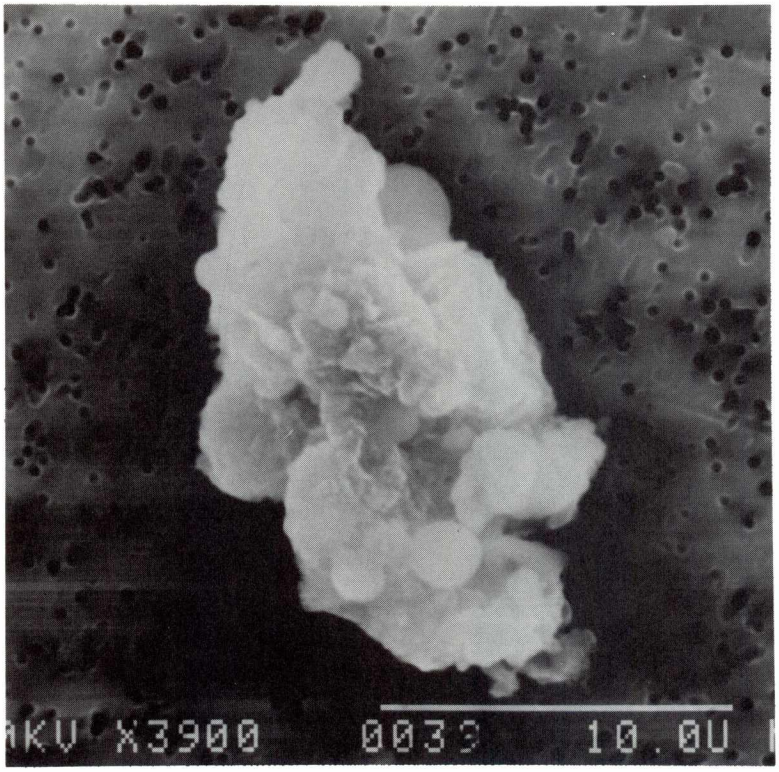
COMMENTS:



Particle Descriptions

TCA Type

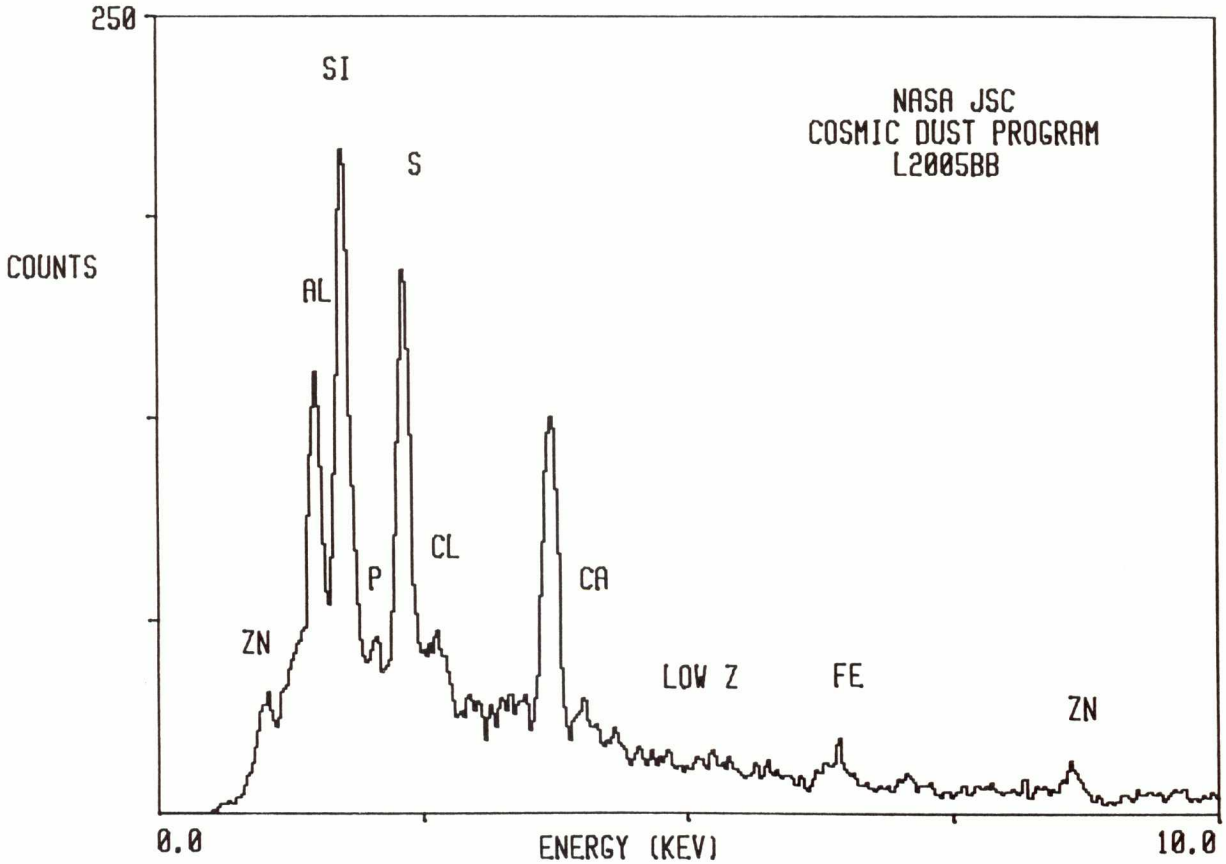
L2005 AB 5



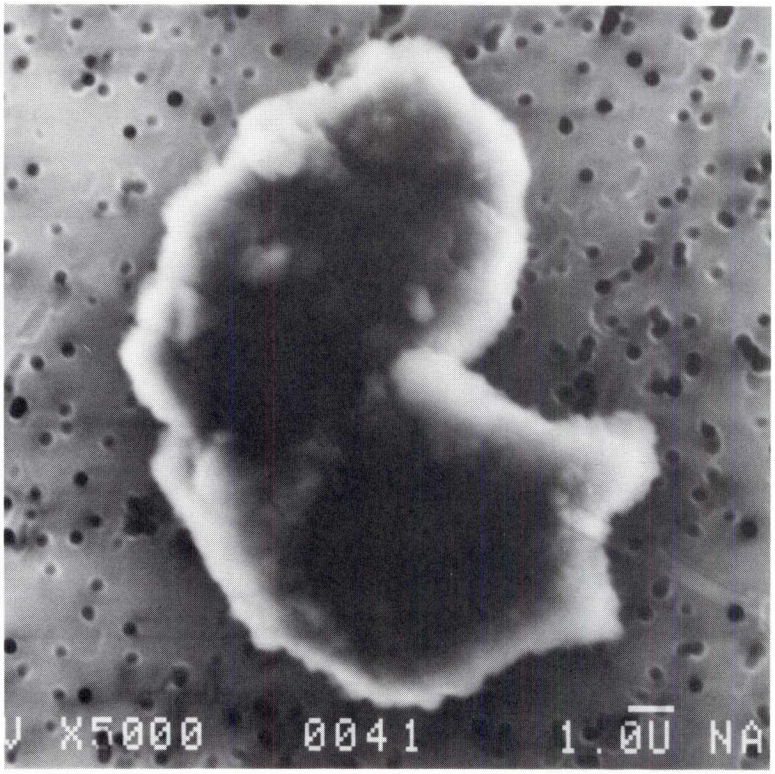
S-92-35945

SIZE: 18x10
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



L2005 AB 6



S-92-35946

SIZE: 15x9

SHAPE: I

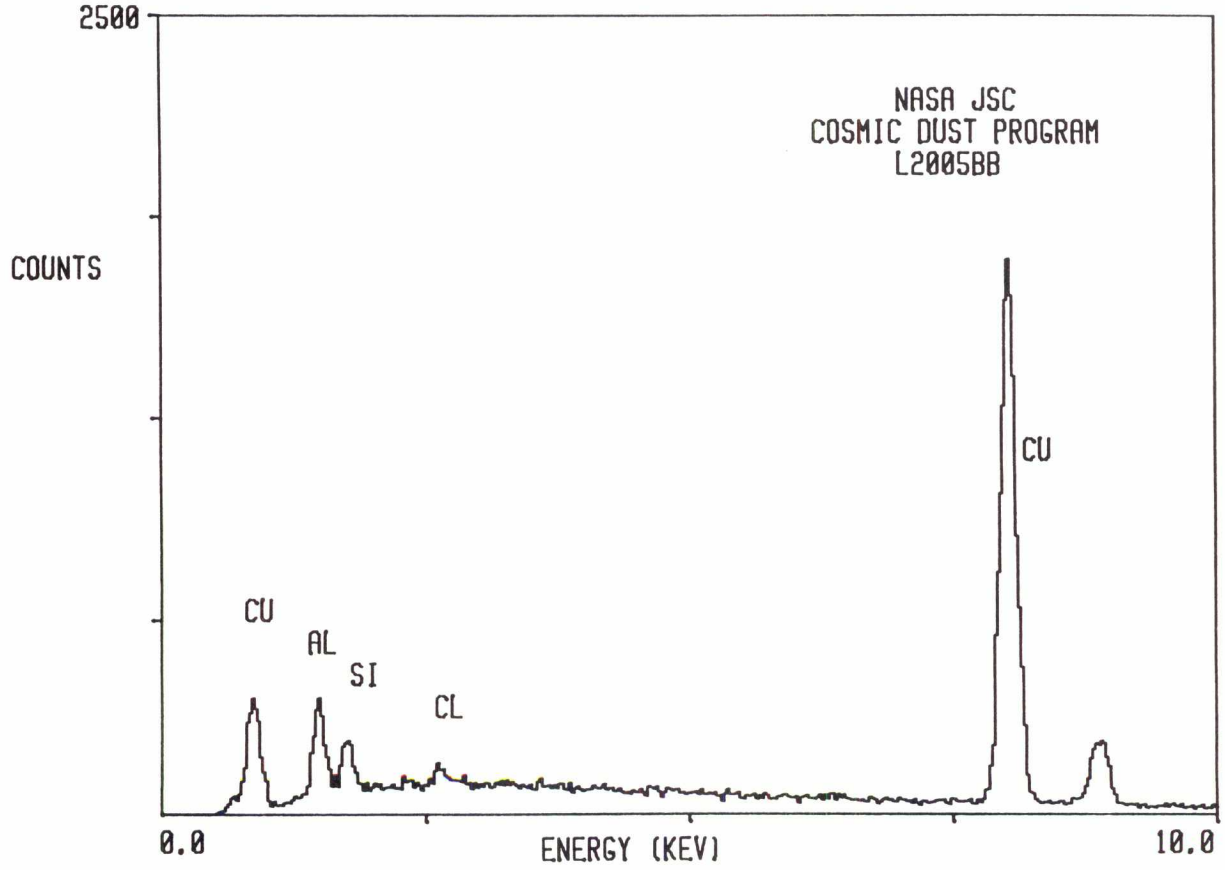
TRANS.: O

COLOR: Brown to Black

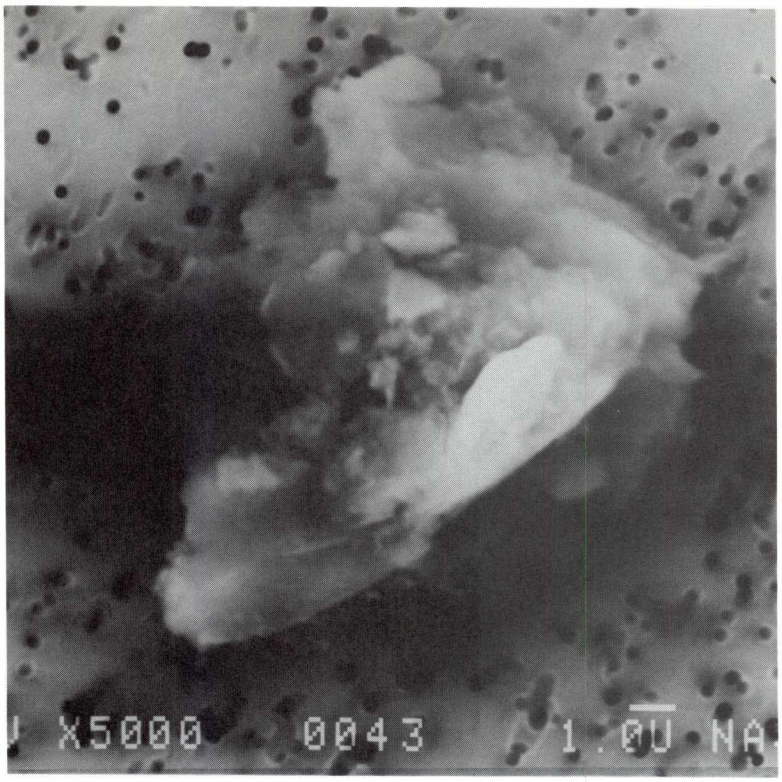
LUSTER: SM

TYPE: TCA

COMMENTS:



L2005 AB 7



S-92-35947

SIZE: 13x11

SHAPE: I

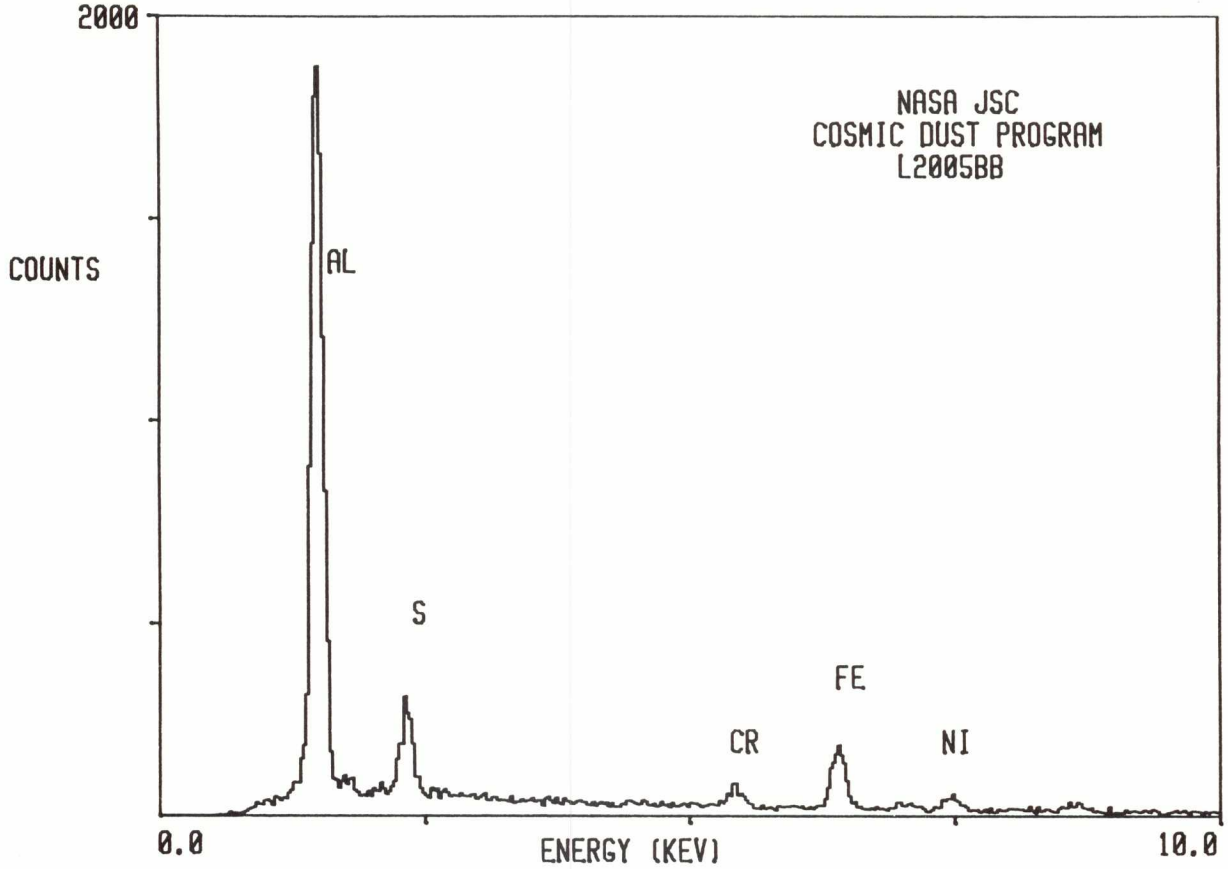
TRANS.: O

COLOR: White to Black

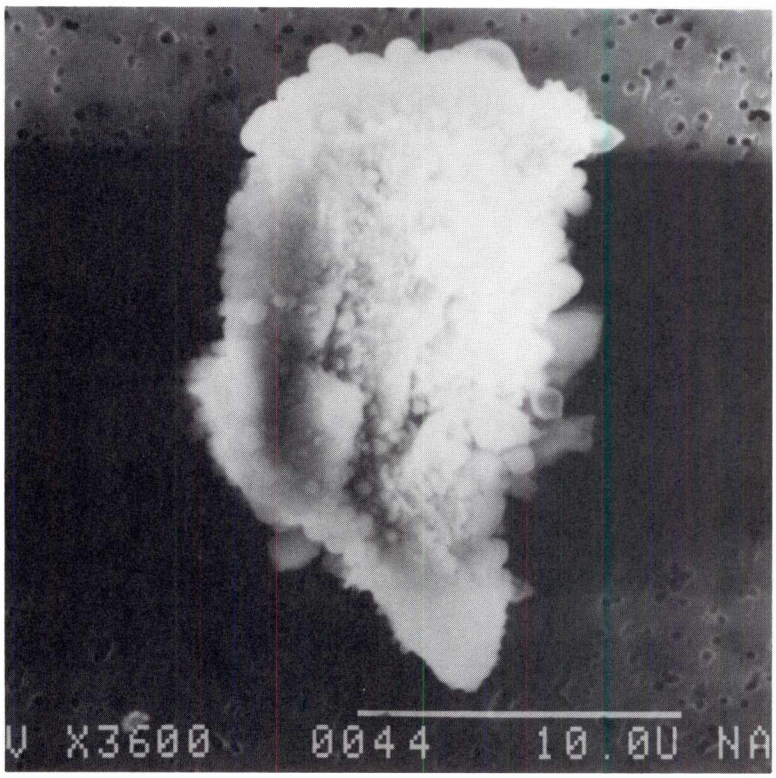
LUSTER: D

TYPE: TCA

COMMENTS:



L2005 AB 9



S-92-35949

SIZE: 23x13

SHAPE: I

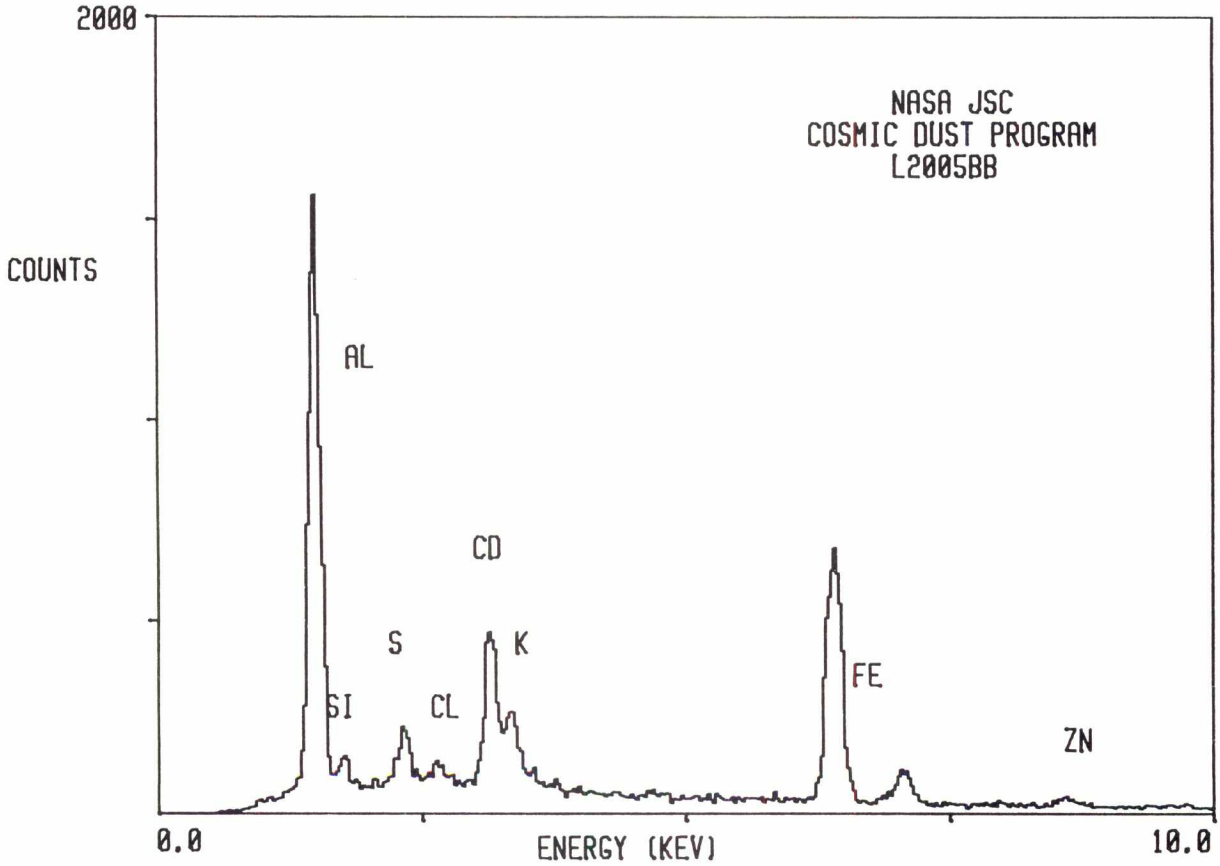
TRANS.: O

COLOR: Black to White

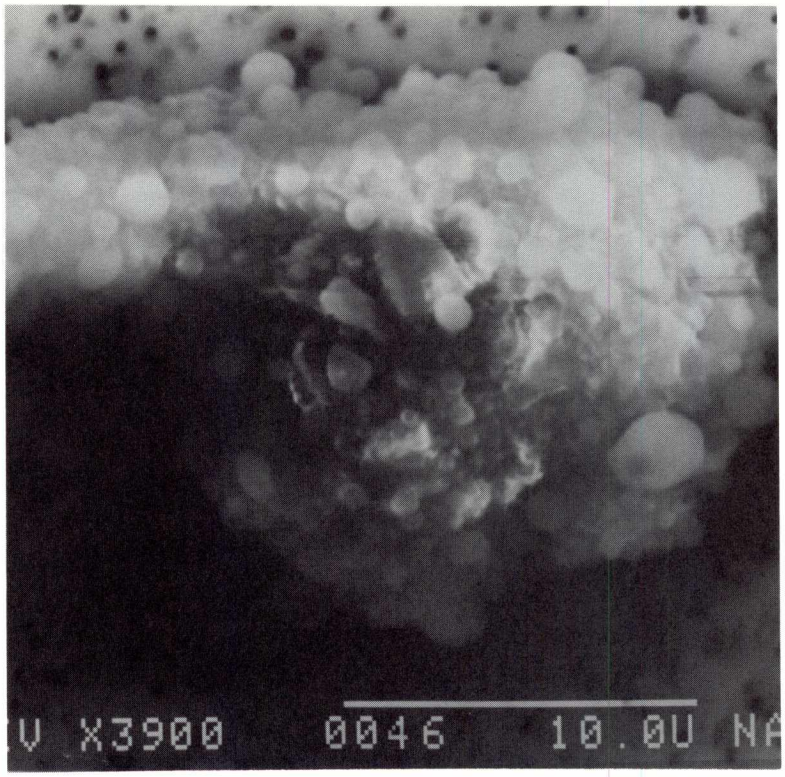
LUSTER: SM

TYPE: TCA

COMMENTS:



L2005 AB 10



S-92-35950

SIZE: 26x16

SHAPE: I

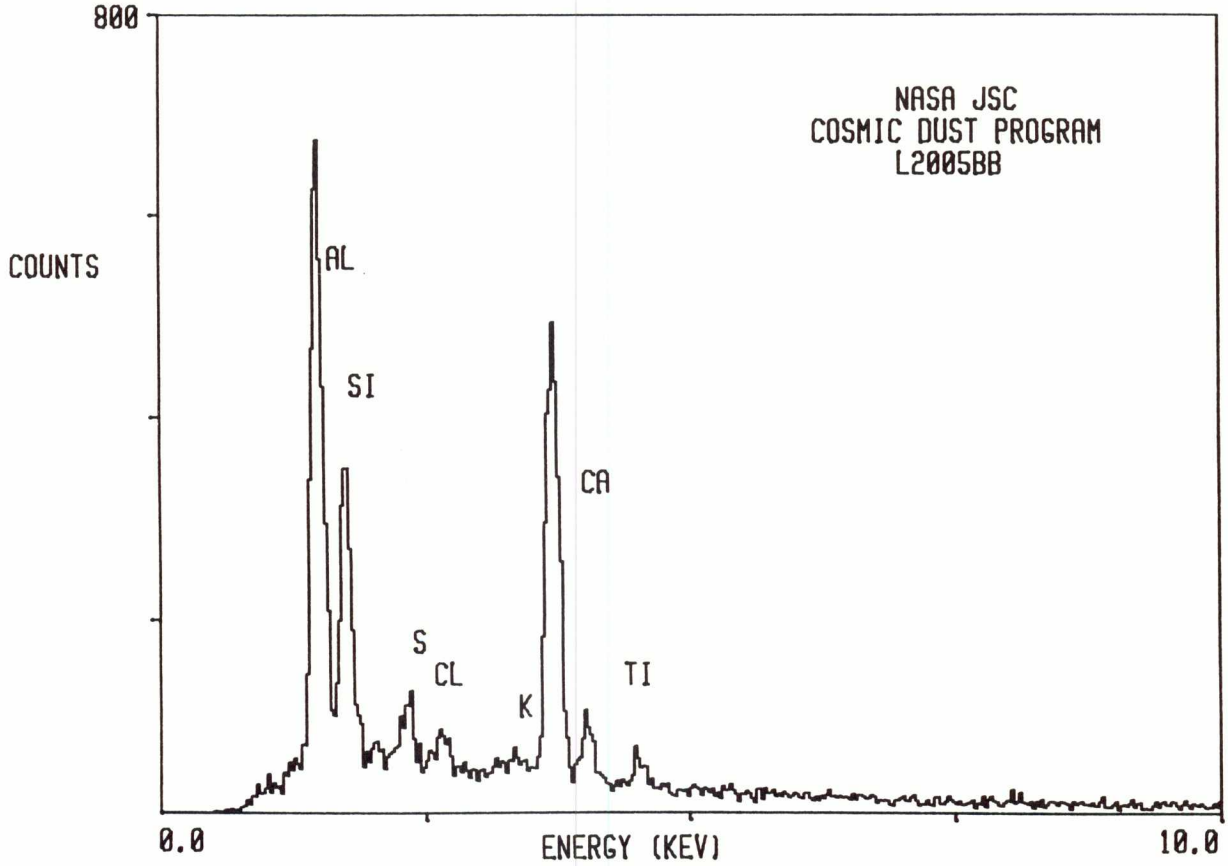
TRANS.: O

COLOR: Black

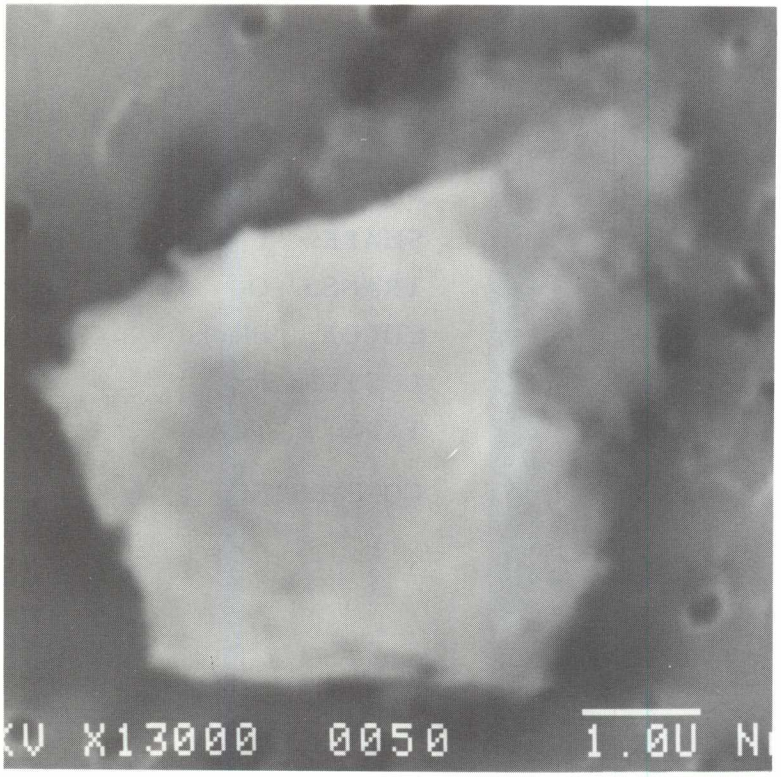
LUSTER: R

TYPE: TCA?

COMMENTS:



L2005 AB 13



S-92-35953

SIZE:

SHAPE: E

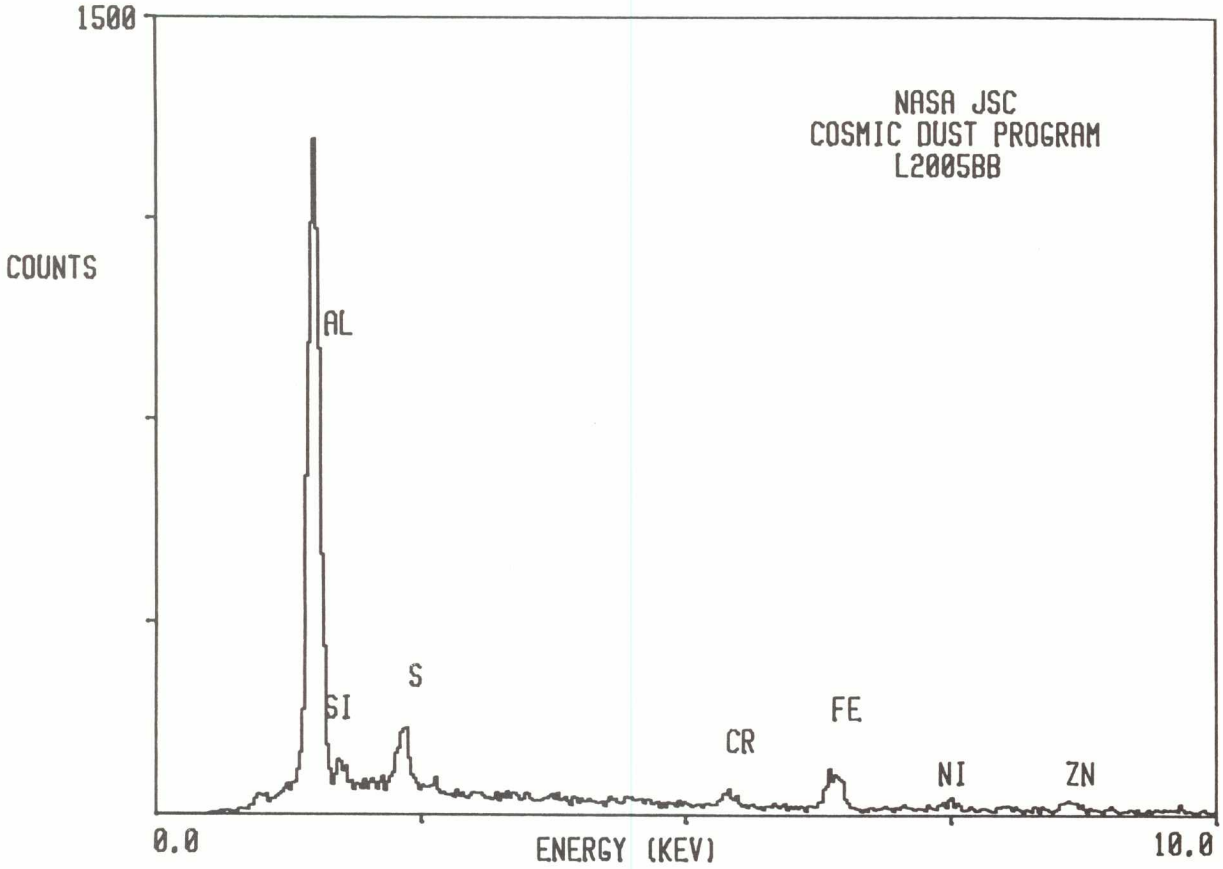
TRANS.: O

COLOR: Black

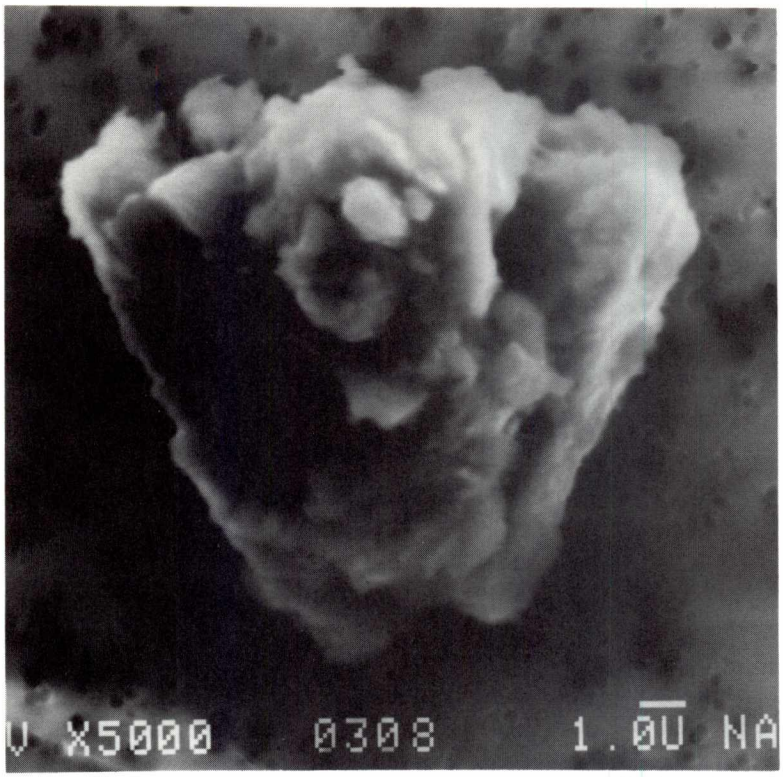
LUSTER: D

TYPE: TCA

COMMENTS:



L2005 AB 14



S-92-35954

SIZE: 14x13

SHAPE: E

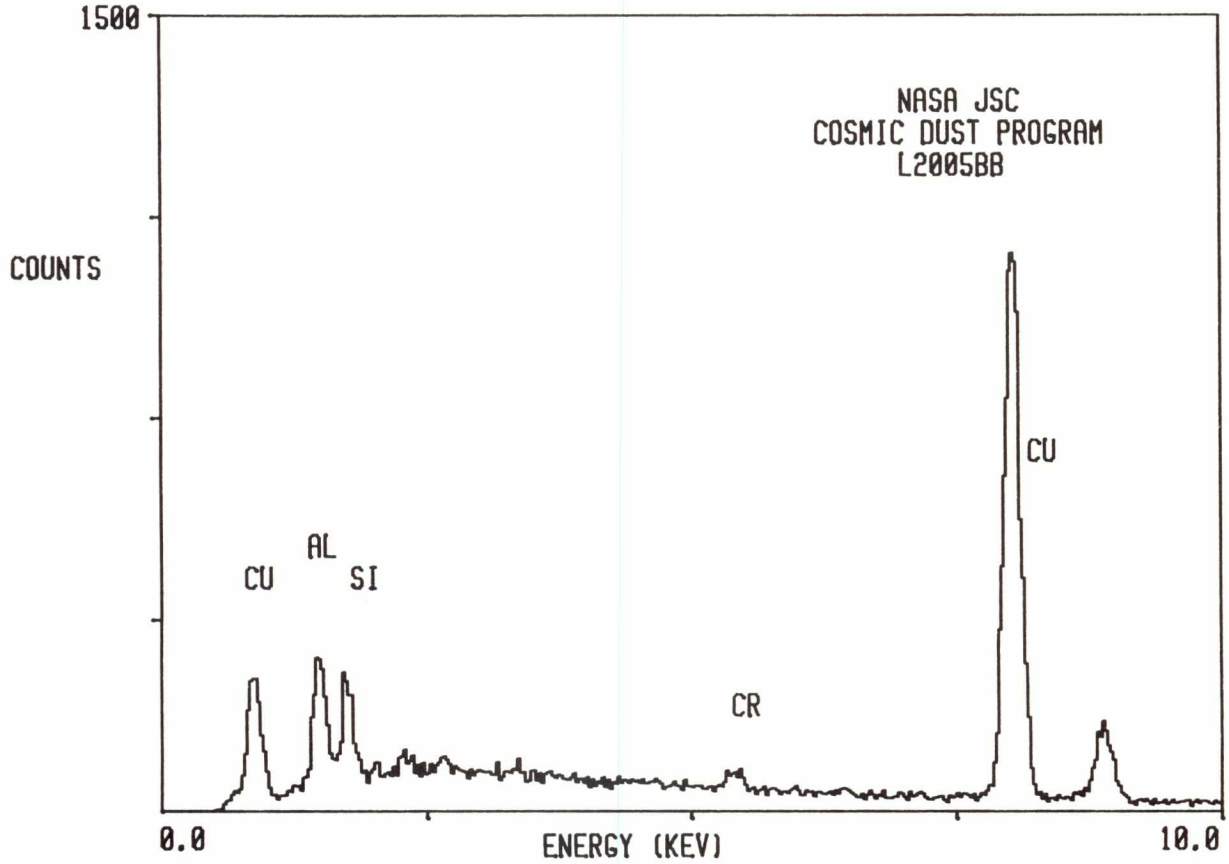
TRANS.: O

COLOR: Brown to Black

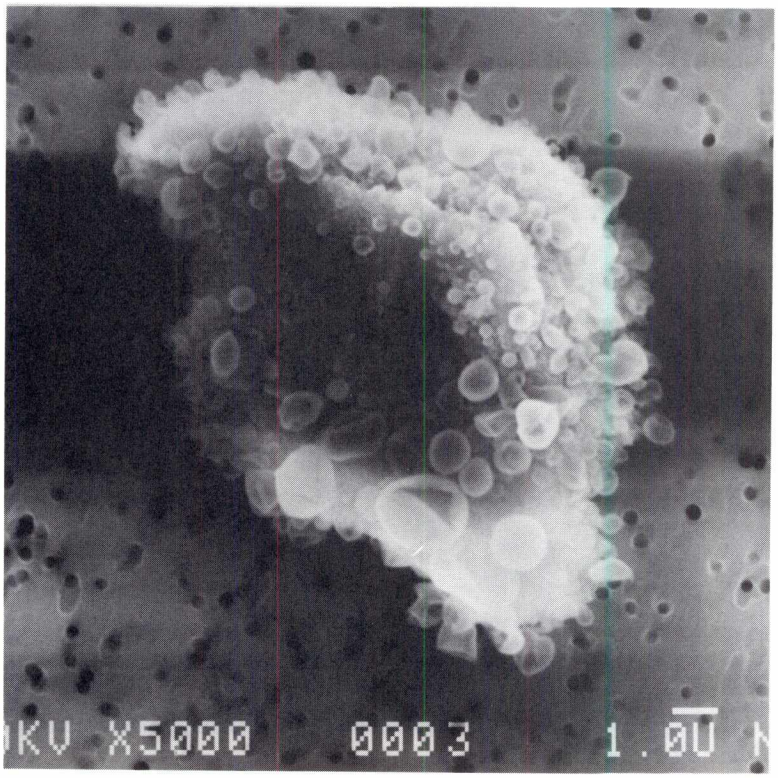
LUSTER: D

TYPE: TCA

COMMENTS:



L2005 AC 1



S-92-35926

SIZE: 14x11

SHAPE: E

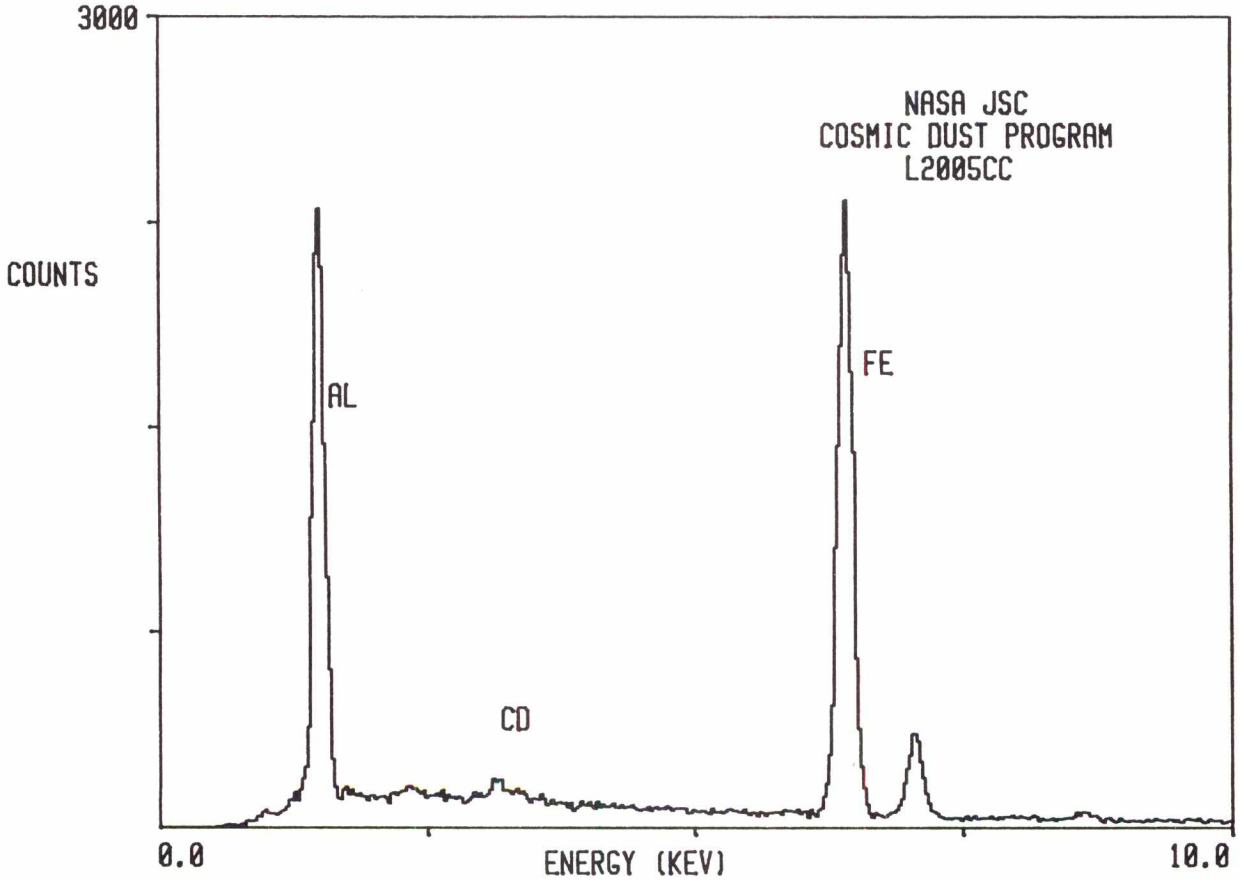
TRANS.: O

COLOR: Brown to Black

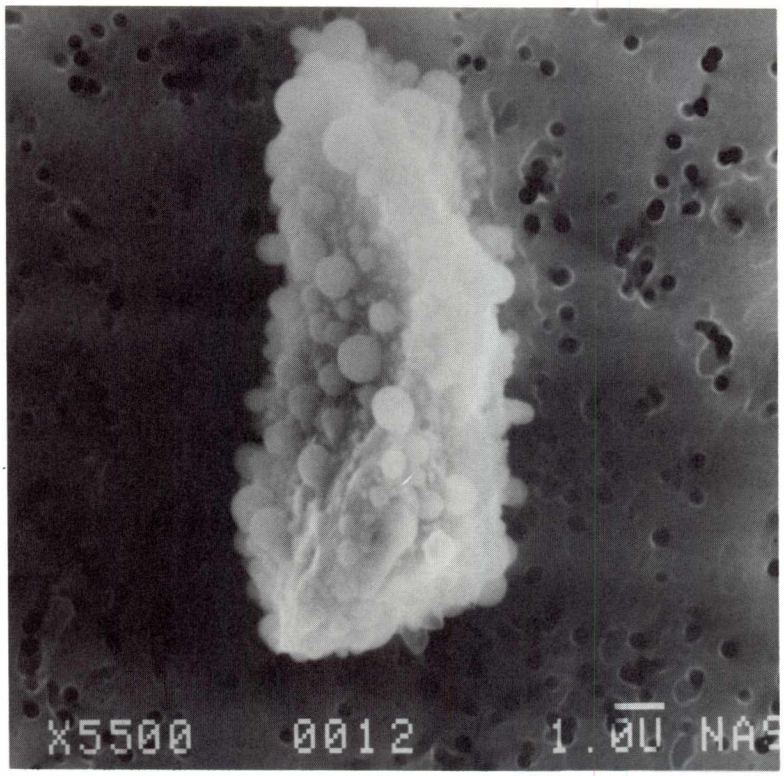
LUSTER: SM

TYPE: TCA

COMMENTS:



L2005 AC 5



S-92-35930

SIZE: 13x6

SHAPE: I

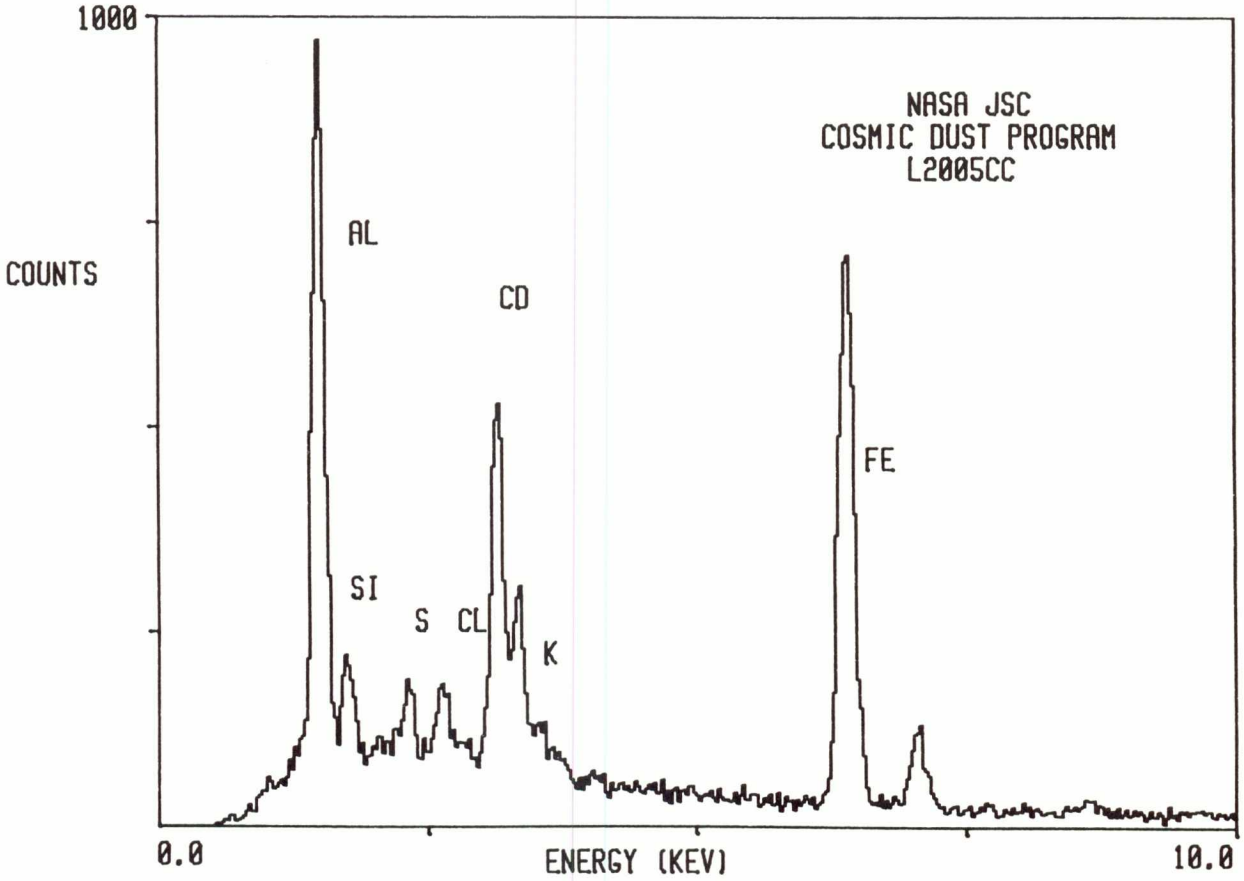
TRANS.: O

COLOR: Black

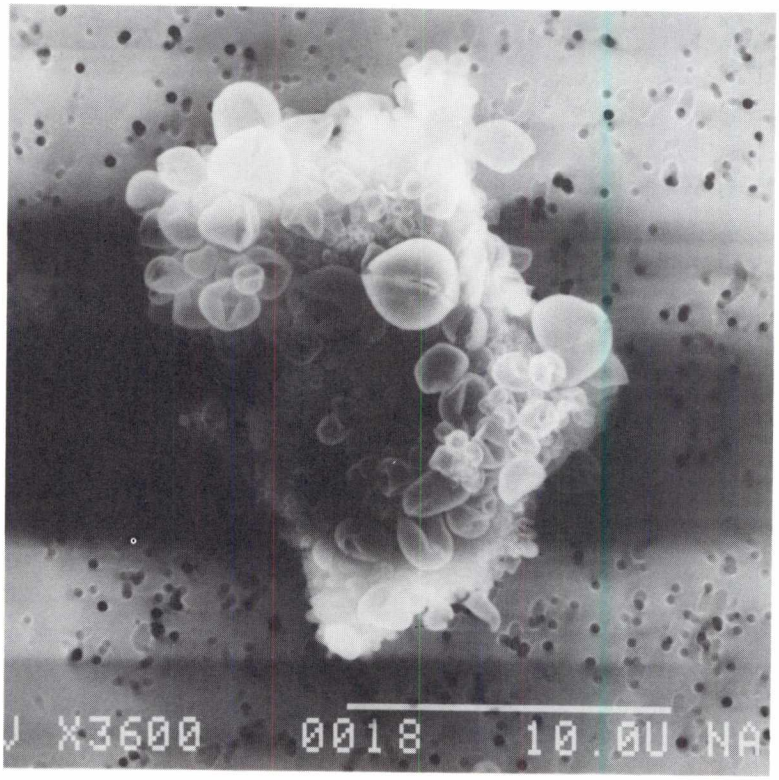
LUSTER: R

TYPE: TCA

COMMENTS:



L2005 AC 8



S-92-35933

SIZE: 16x12

SHAPE: E

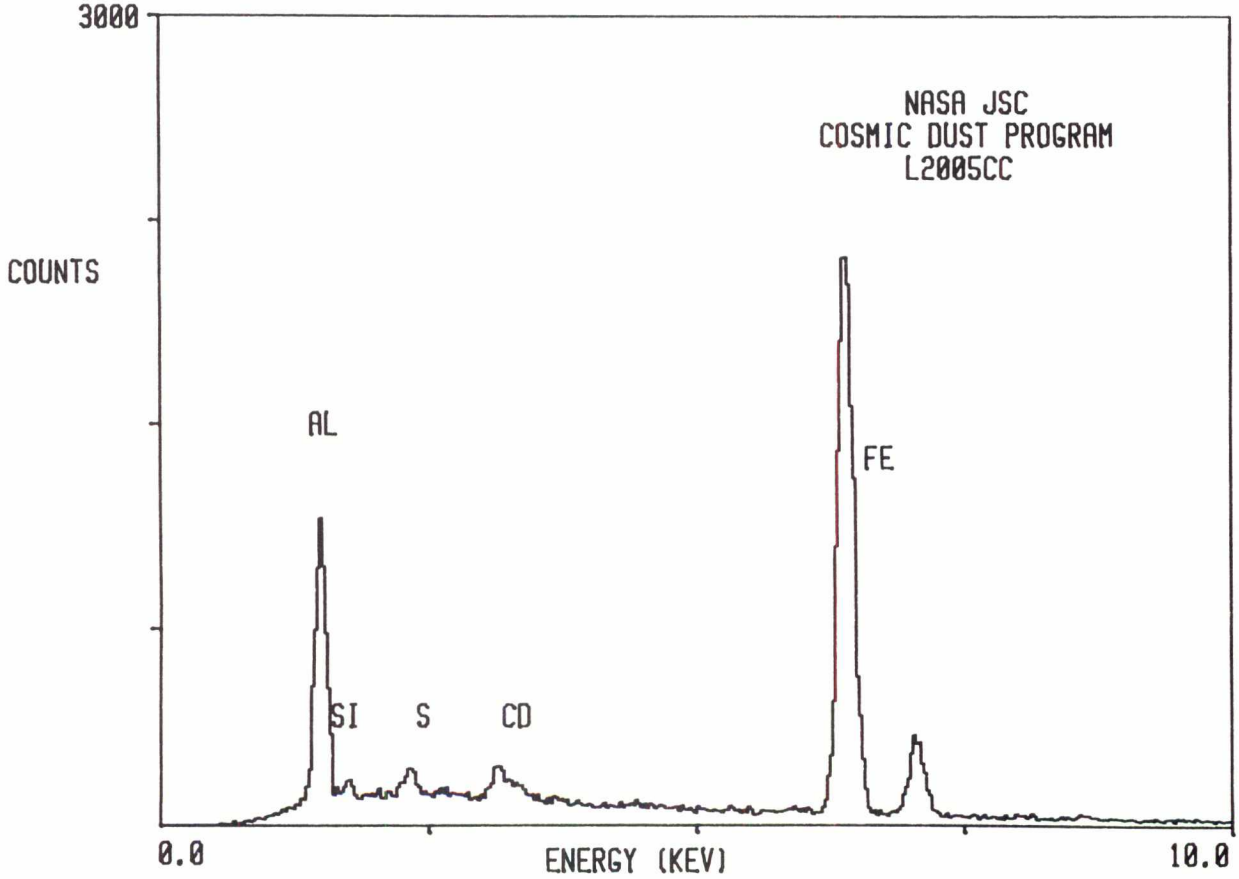
TRANS.: O

COLOR: Brown to Black

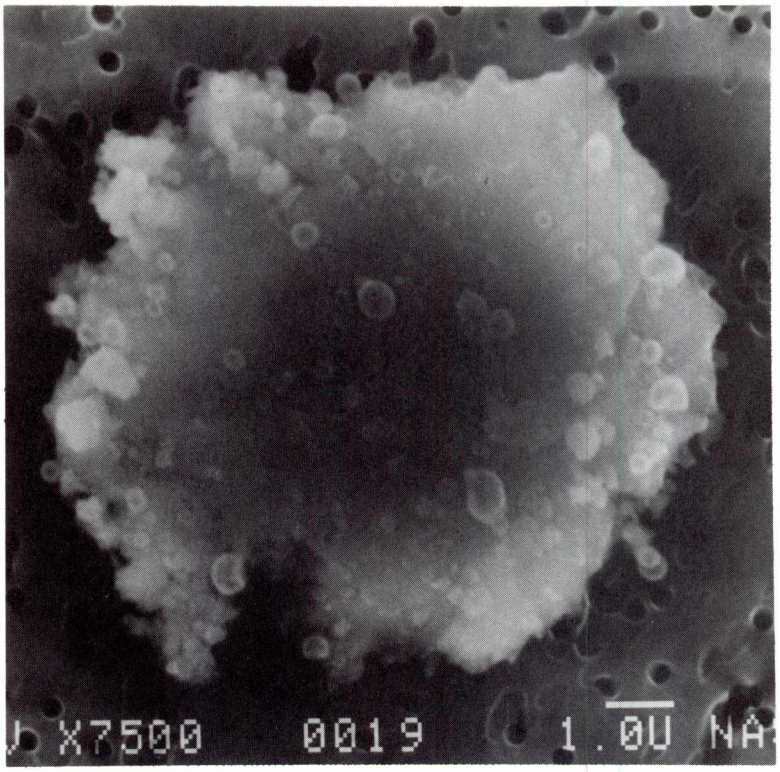
LUSTER: SM

TYPE: TCA

COMMENTS:



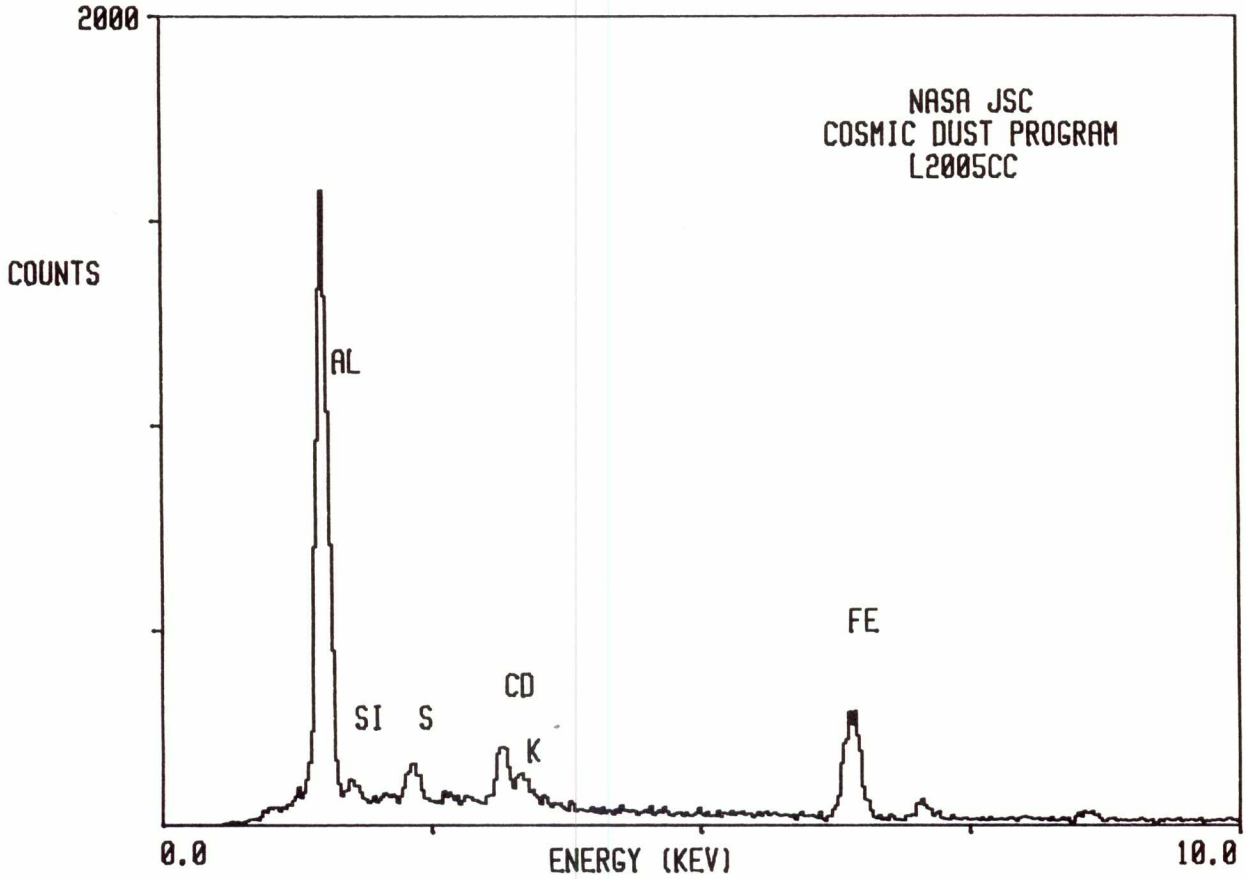
L2005 AC 9



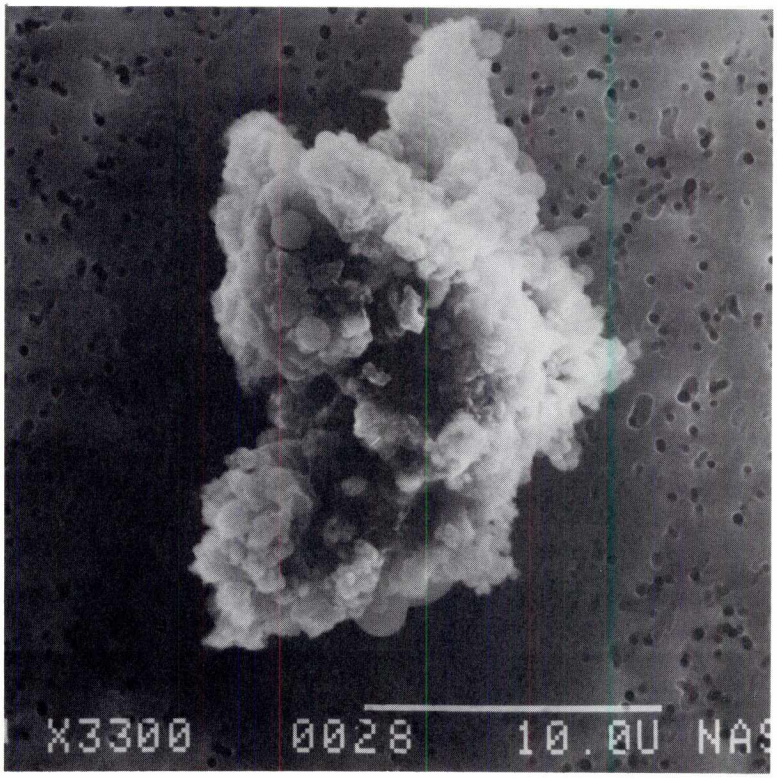
S-92-35934

SIZE: 11
SHAPE: S
TRANS.: O
COLOR: Brown
LUSTER: SM
TYPE: TCA

COMMENTS:



L2005 AC 13



S-92-35938

SIZE: 25x16

SHAPE: I

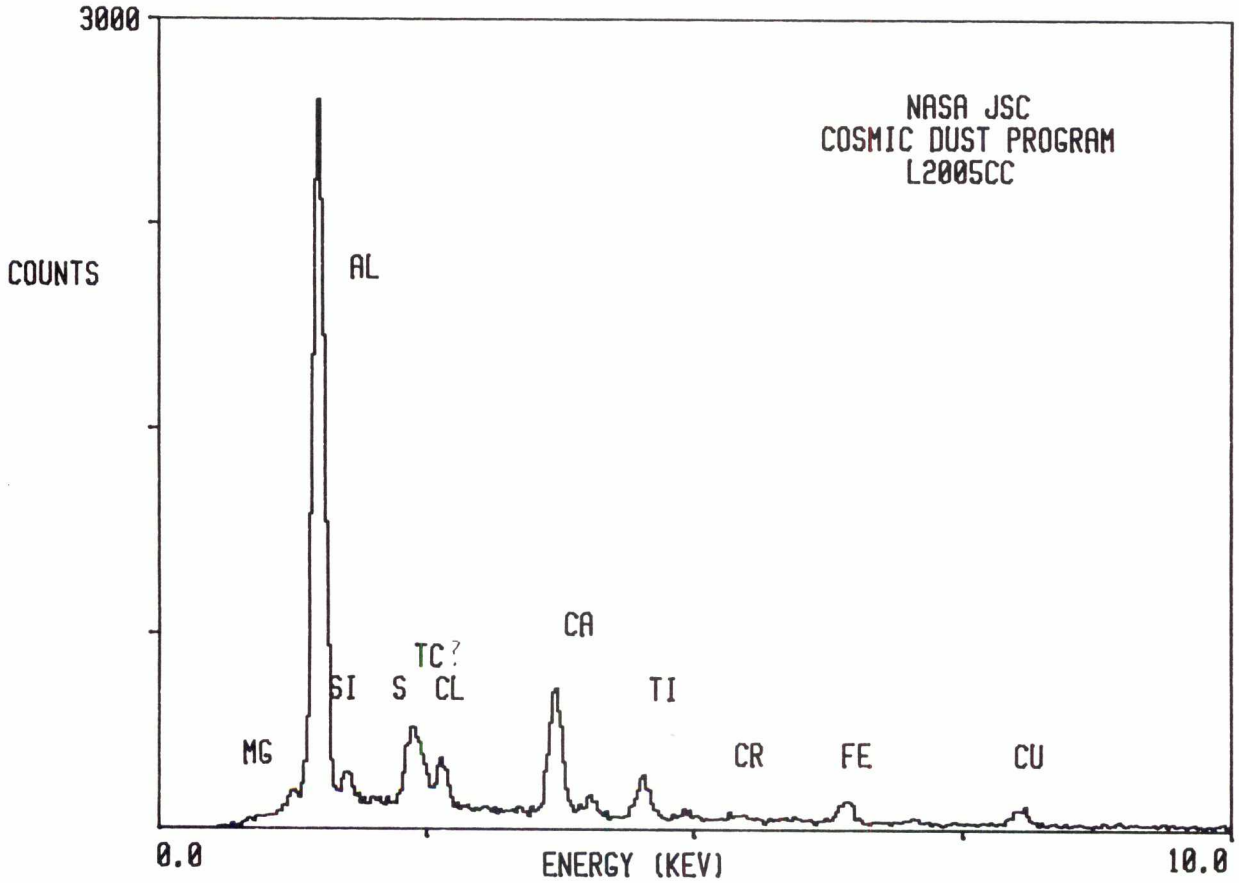
TRANS.: O

COLOR: Black

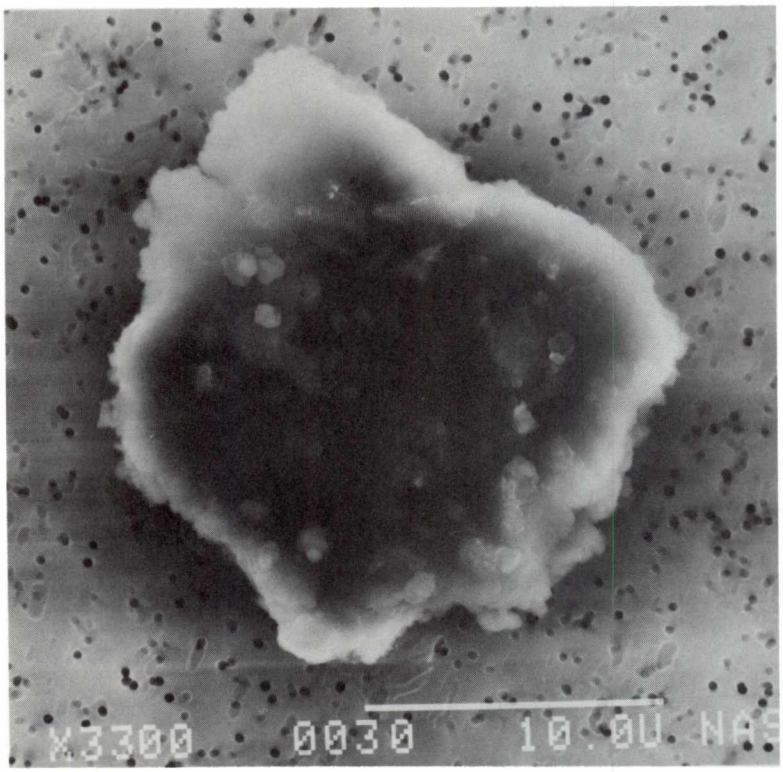
LUSTER: R

TYPE: TCA

COMMENTS:
TC is very doubtful



L2005 AC 14



S-92-35939

SIZE: 19x17

SHAPE: E

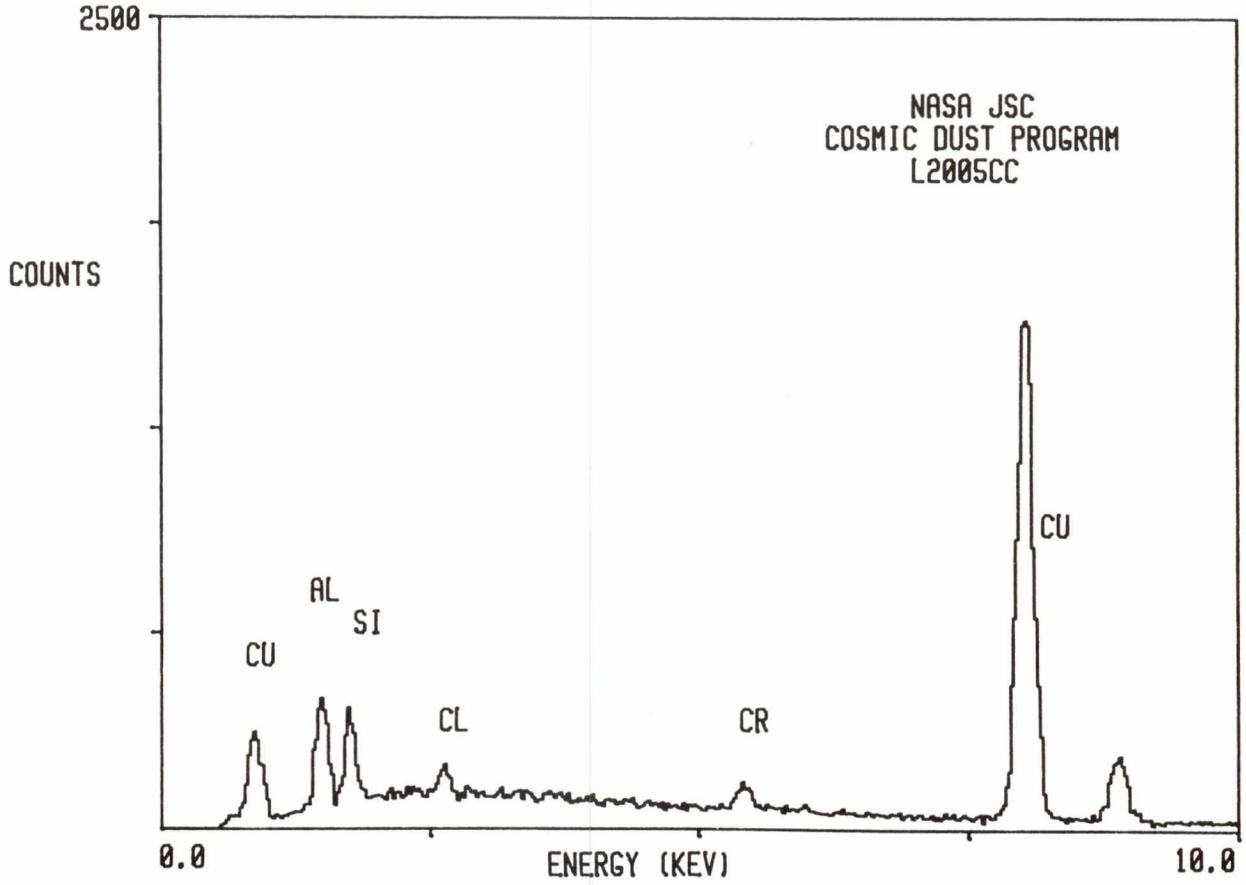
TRANS.: O

COLOR: Red to Green

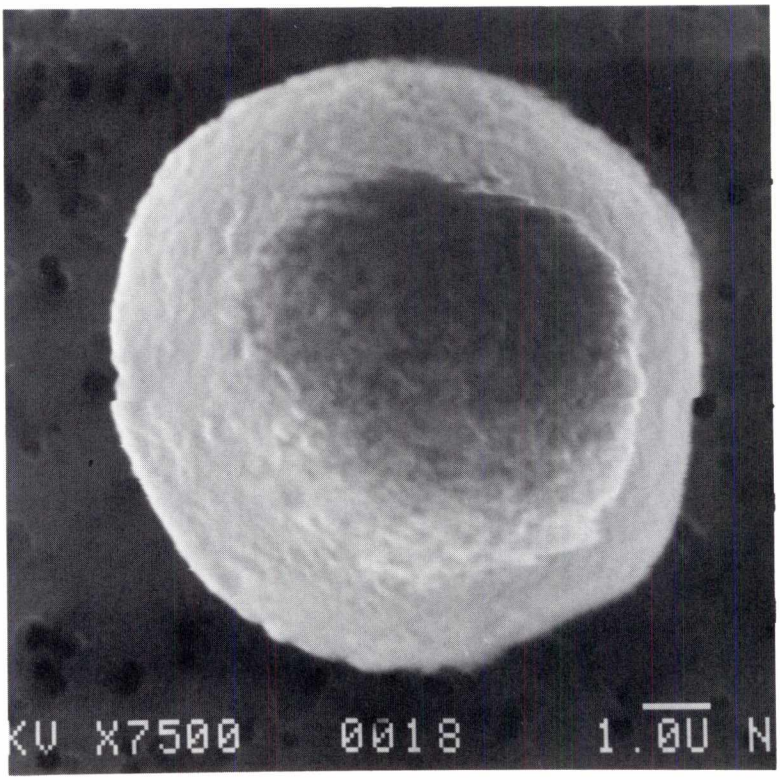
LUSTER: SM

TYPE: TCA

COMMENTS:



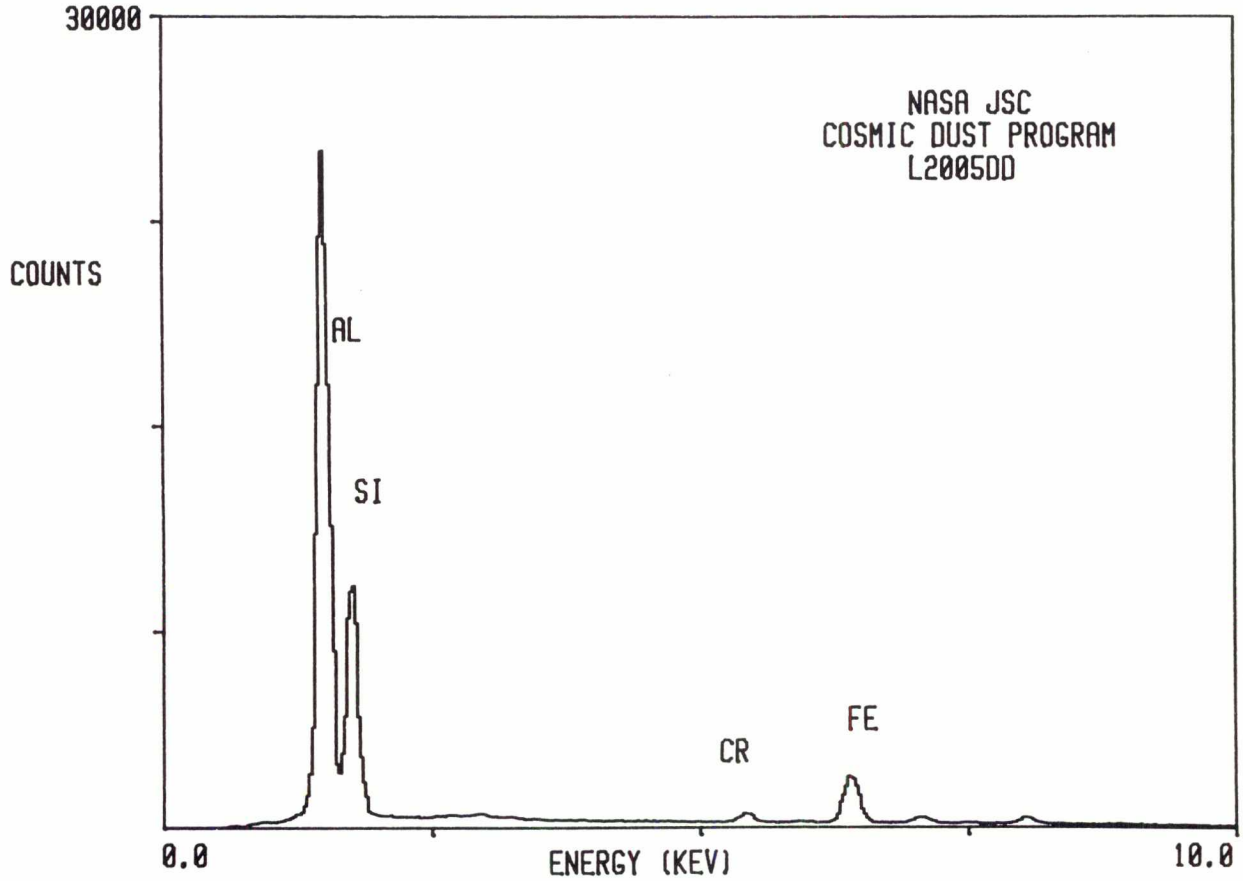
L2005 AD 1



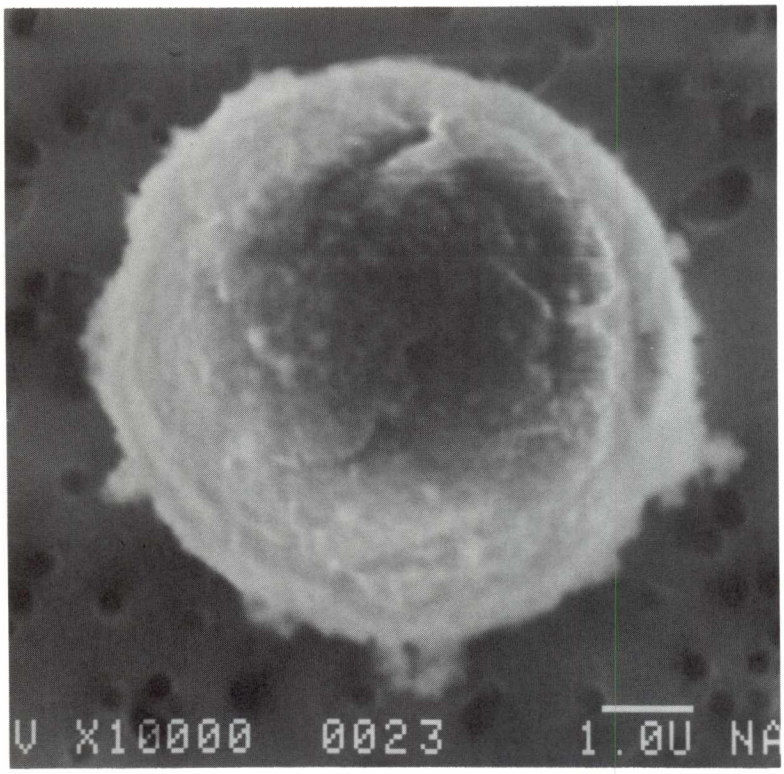
S-92-35902

SIZE: 9
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: TCA

COMMENTS:



L2005 AD 3



S-92-35904

SIZE: 6

SHAPE: S

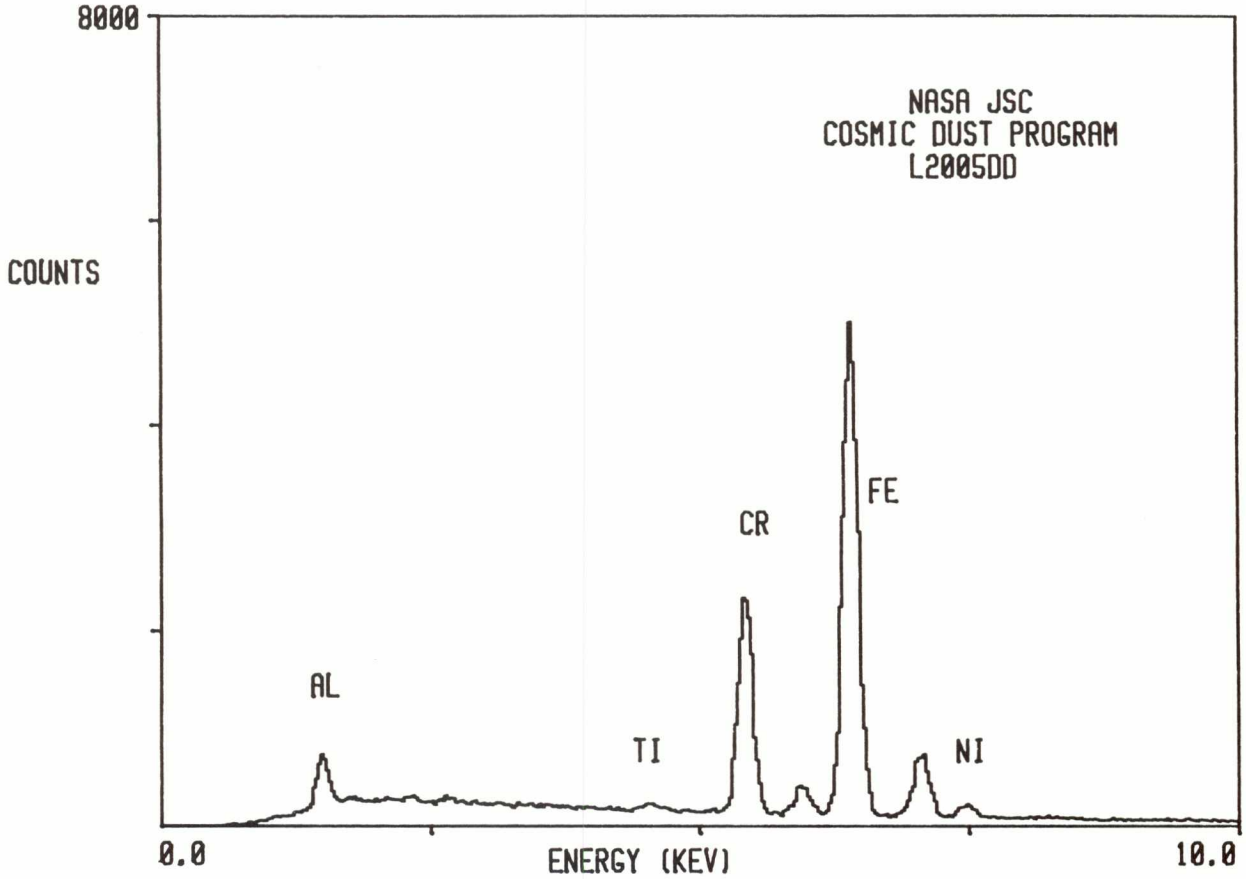
TRANS.: O

COLOR: Black

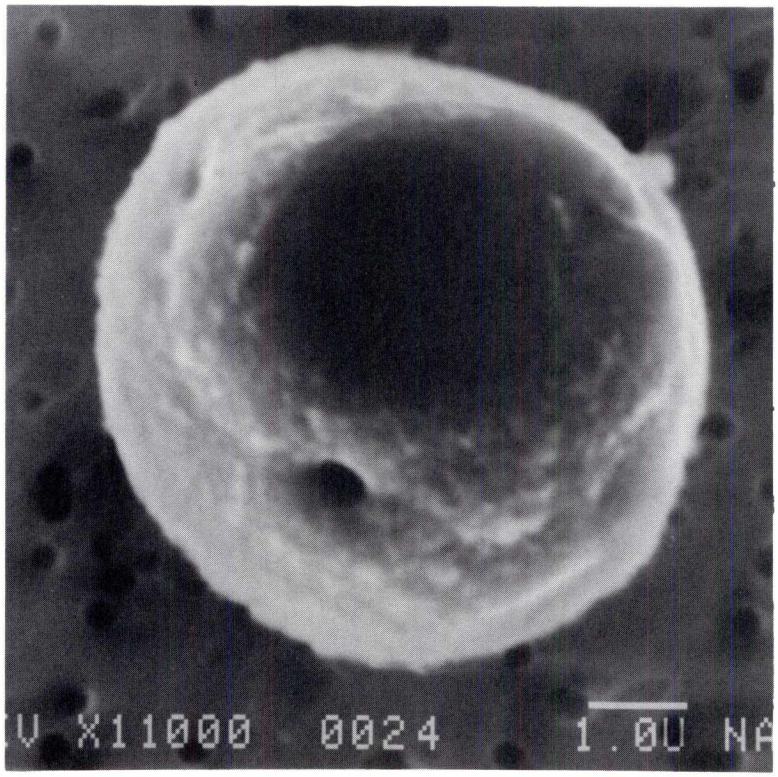
LUSTER: D

TYPE: TCA?

COMMENTS:



L2005 AD 4



S-92-35905

SIZE: 7

SHAPE: S

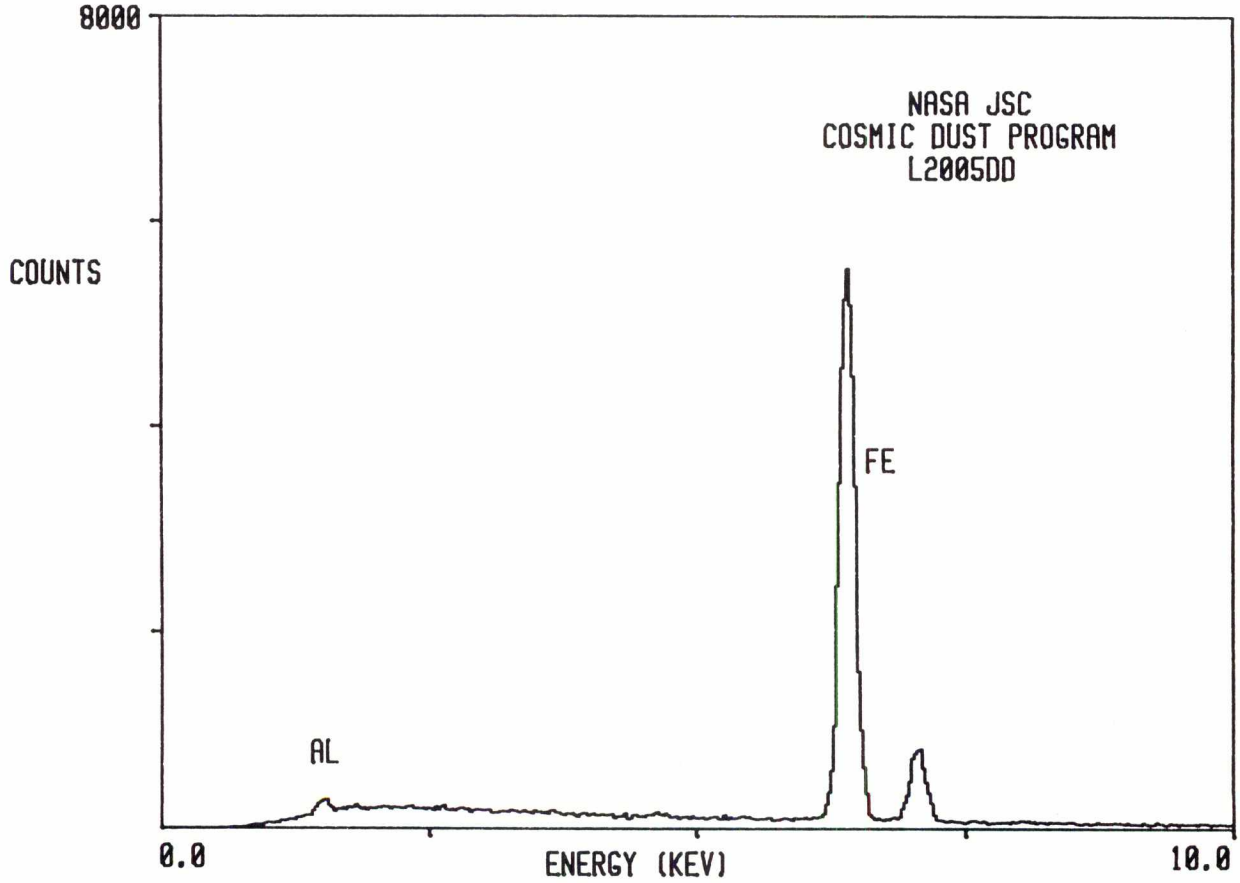
TRANS.: O

COLOR: Black

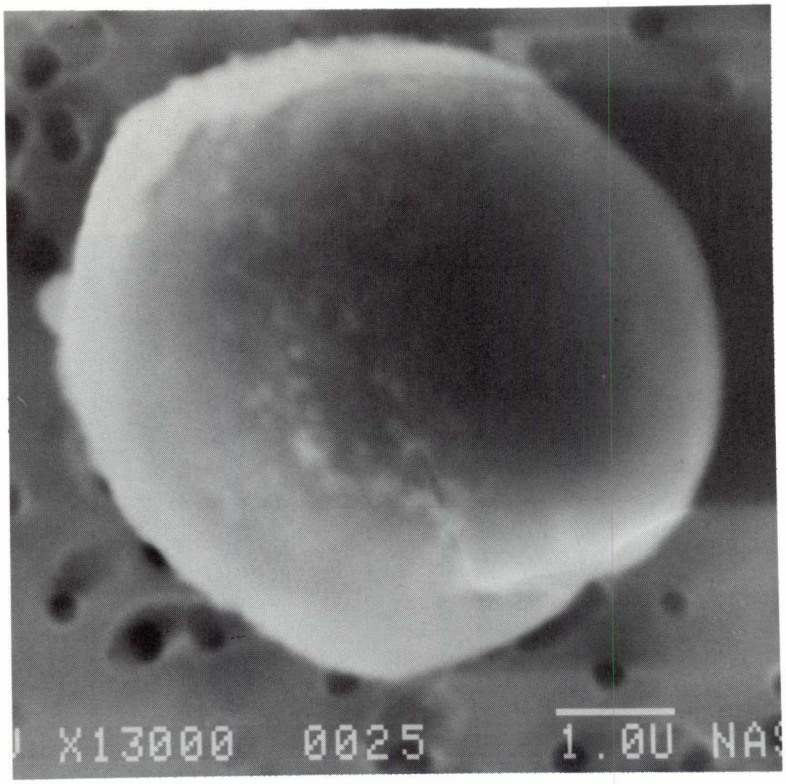
LUSTER: R

TYPE: TCA?

COMMENTS:



L2005 AD 5



S-92-35906

SIZE: 5

SHAPE: S

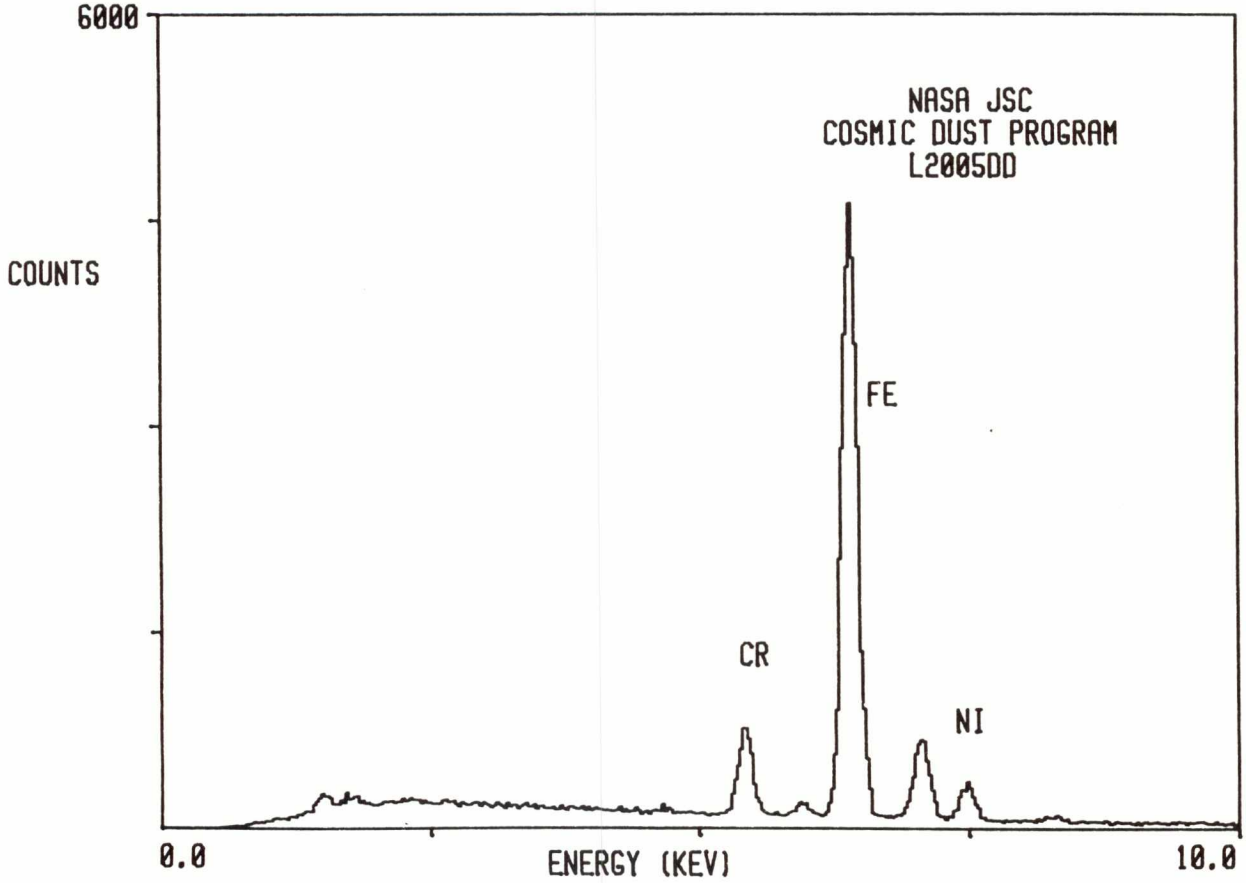
TRANS.: O

COLOR: Black

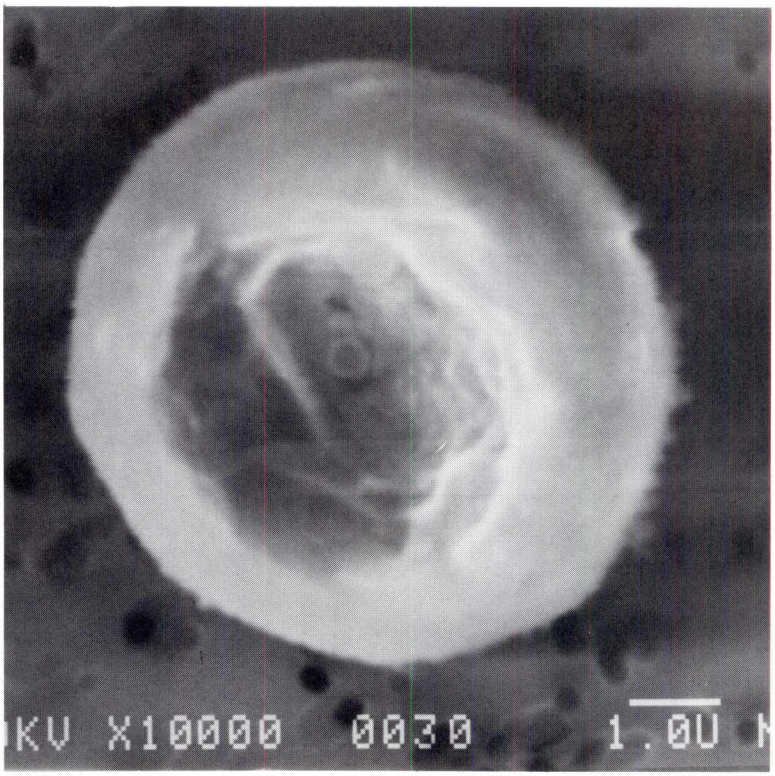
LUSTER: D

TYPE: TCA?

COMMENTS:



L2005 AD 9



S-92-35909

SIZE: 7

SHAPE: S

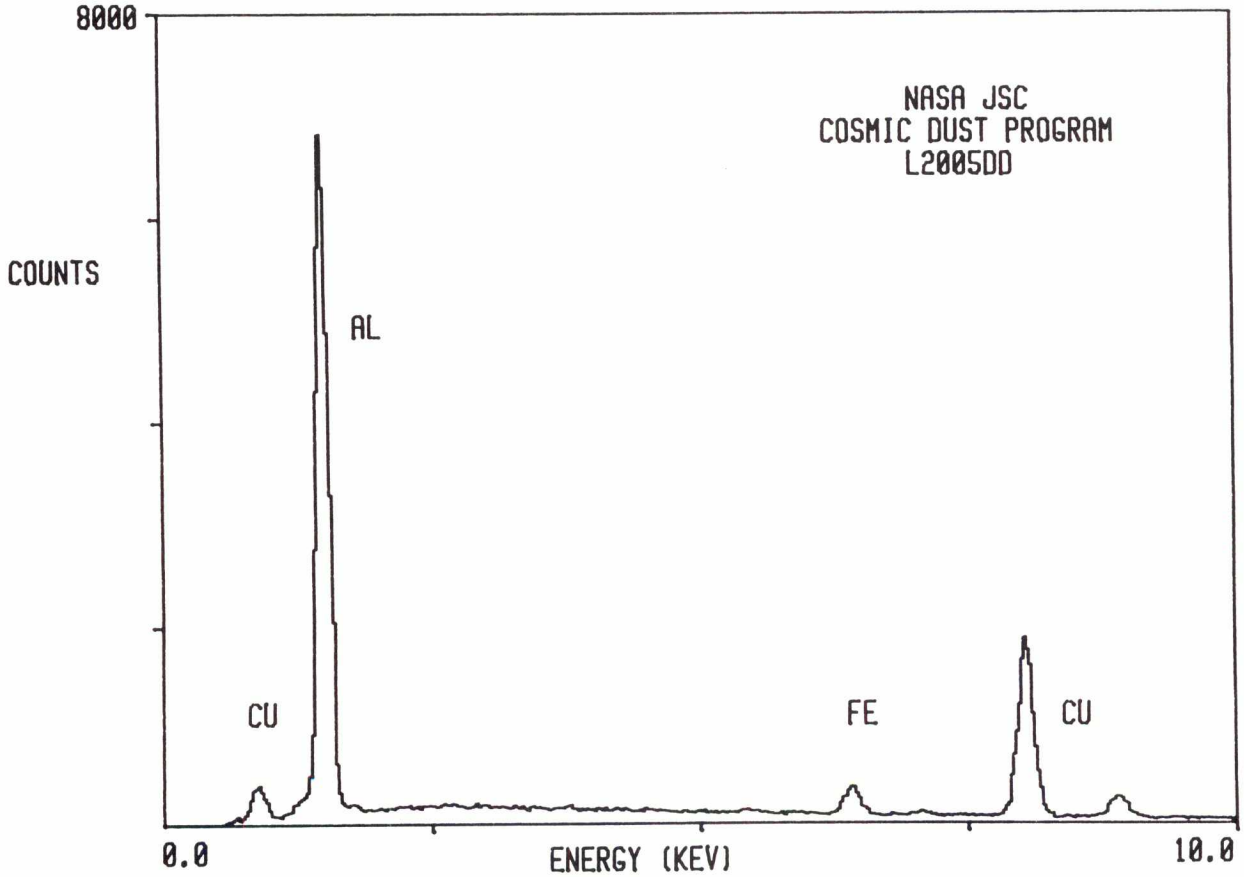
TRANS.: T

COLOR: Colorless

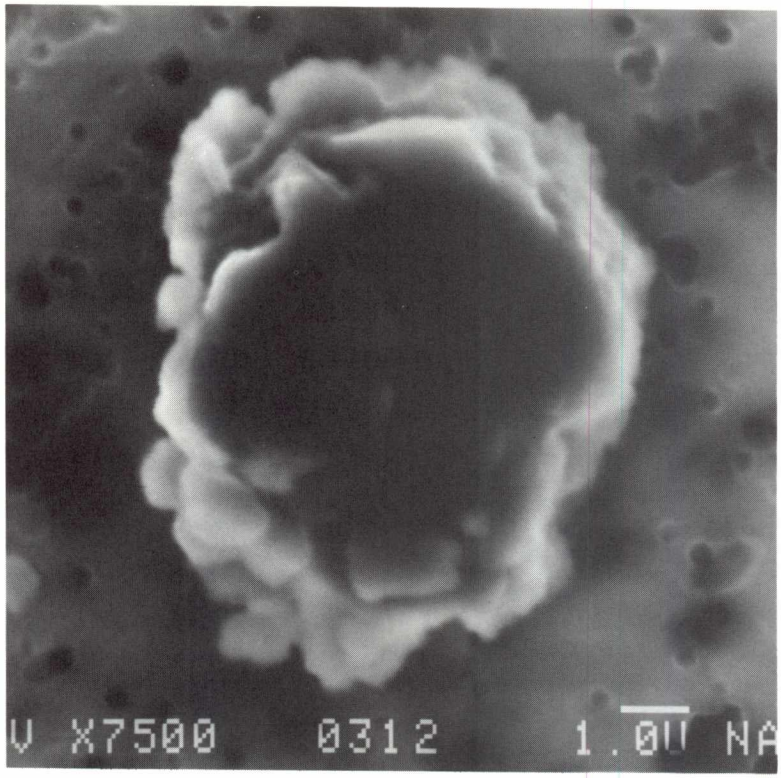
LUSTER: V

TYPE: TCA

COMMENTS:



L2005 AD 10



S-92-35910

SIZE: 10

SHAPE: S

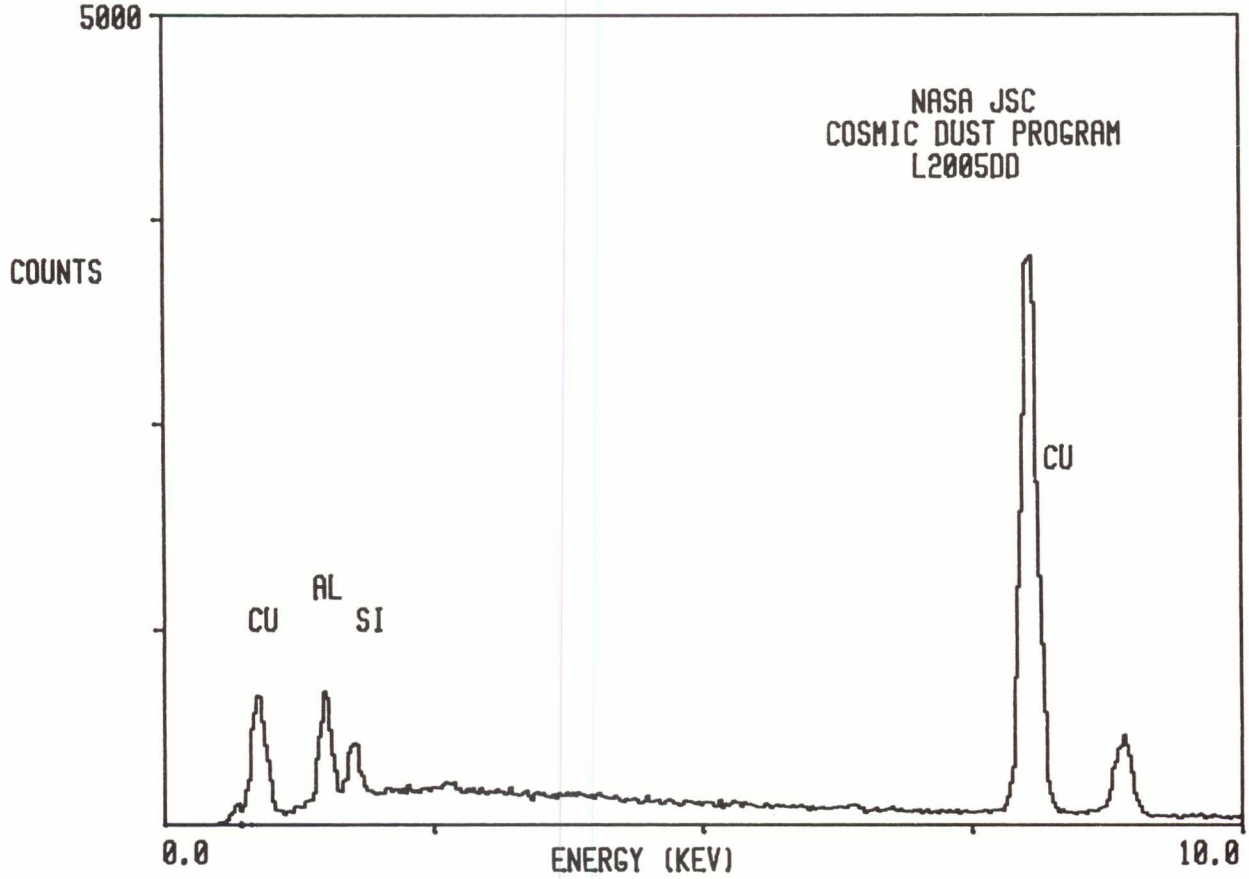
TRANS.: O

COLOR: Green to Black

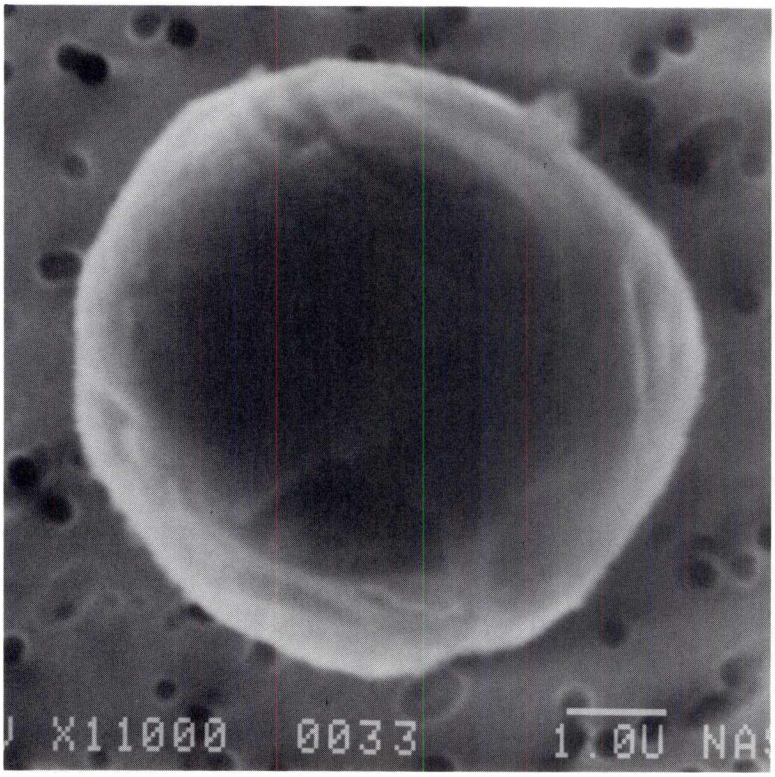
LUSTER: M

TYPE: TCA

COMMENTS:



L2005 AD 12



S-92-35912

SIZE: 6

SHAPE: S

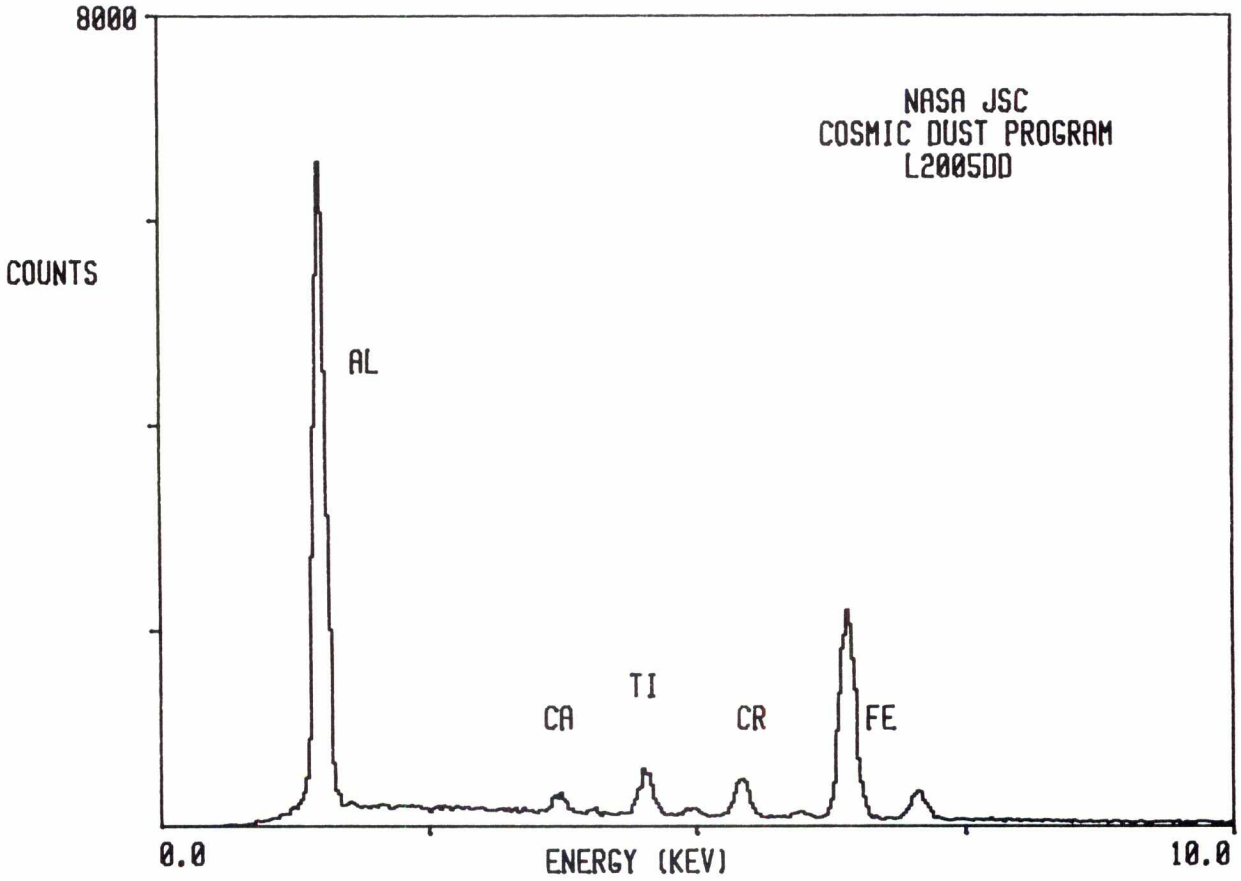
TRANS.: O

COLOR: Black

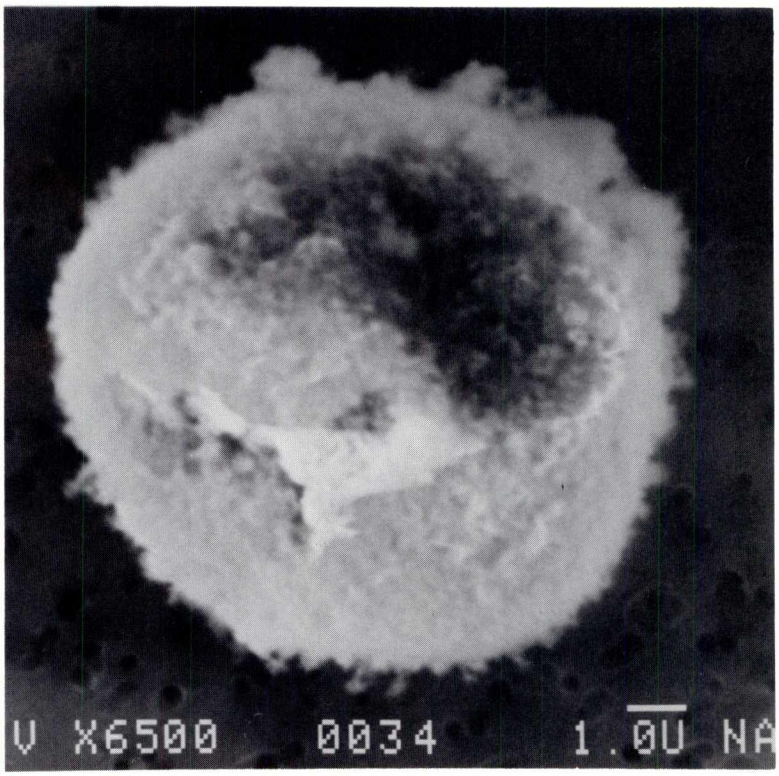
LUSTER: R

TYPE: TCA

COMMENTS:



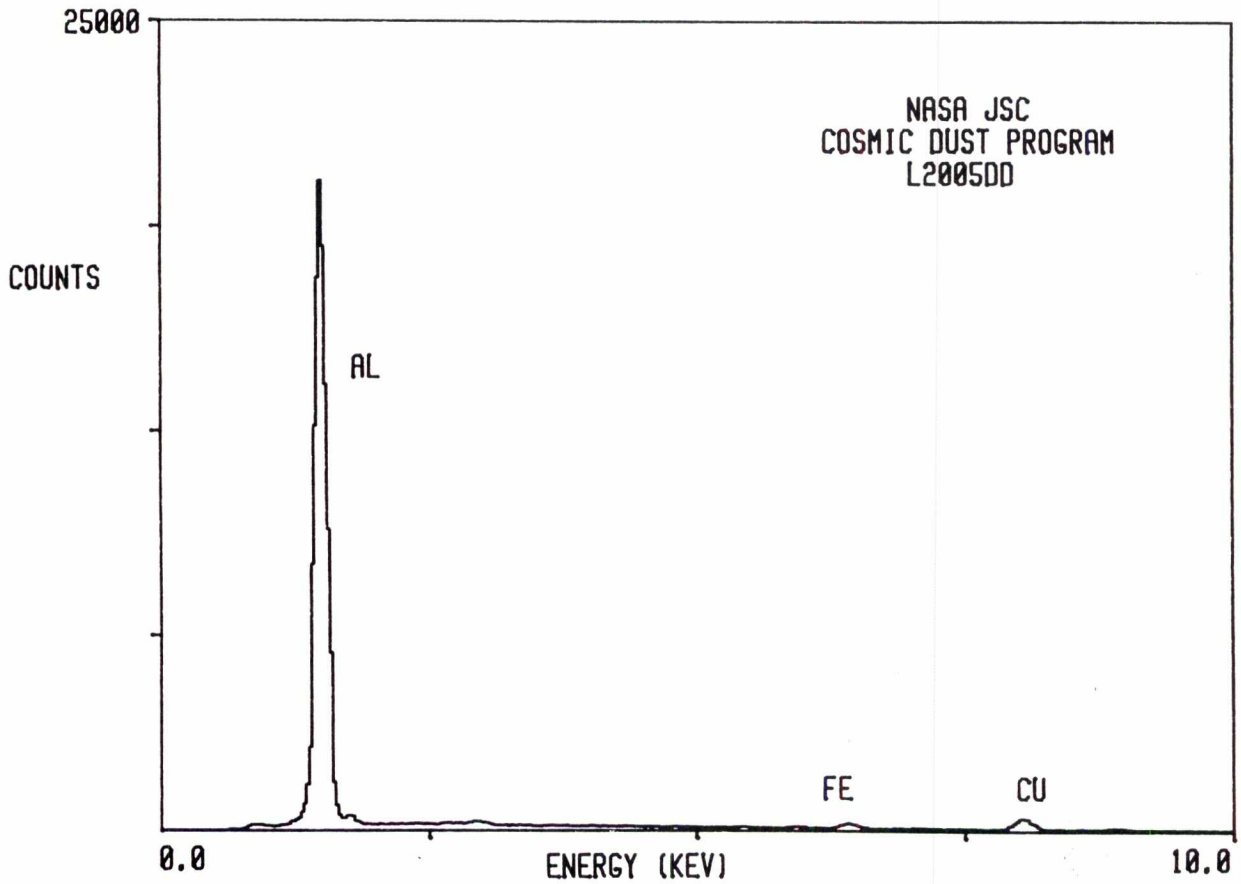
L2005 AD 13



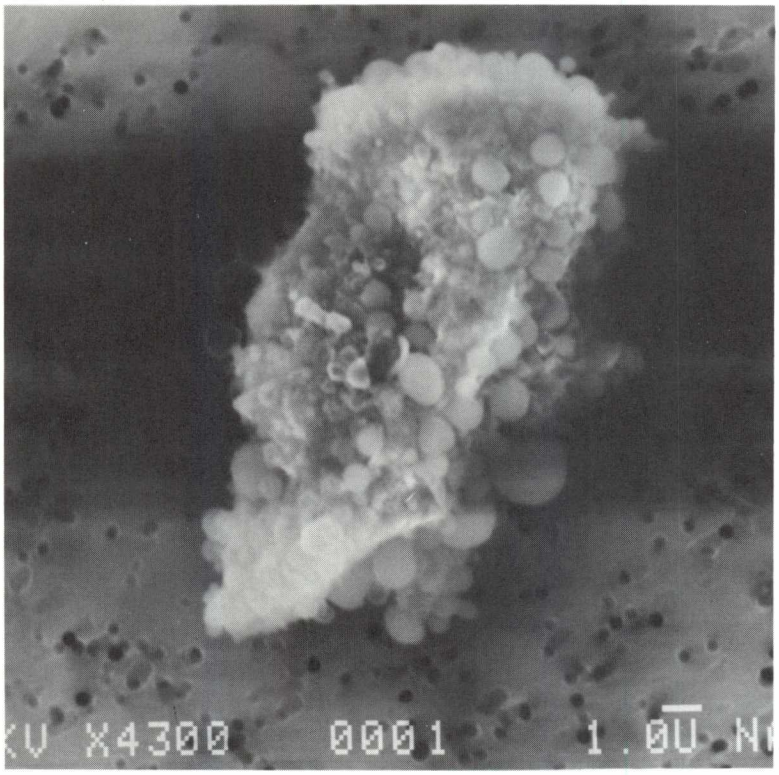
S-92-35913

SIZE: 11
SHAPE: S
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA

COMMENTS:



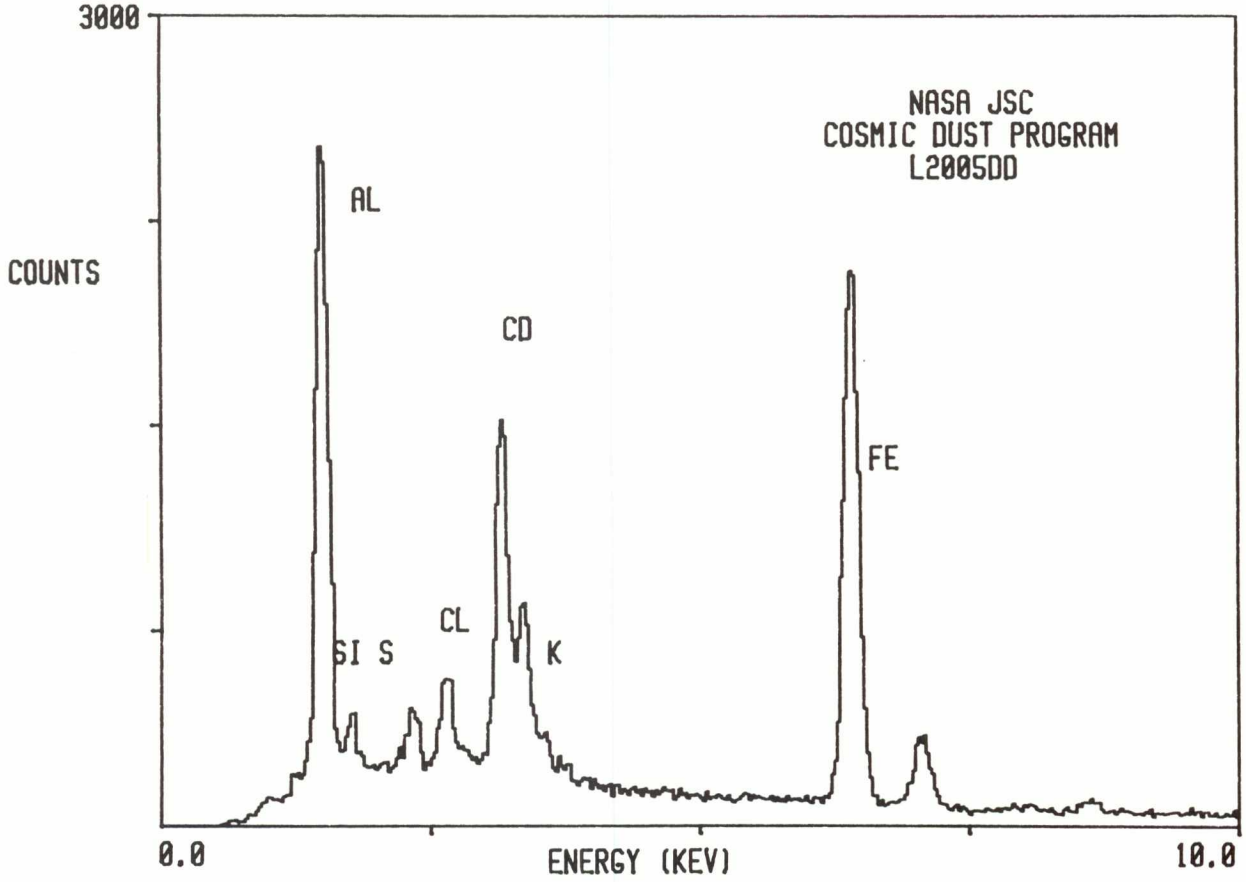
L2005 AD 19



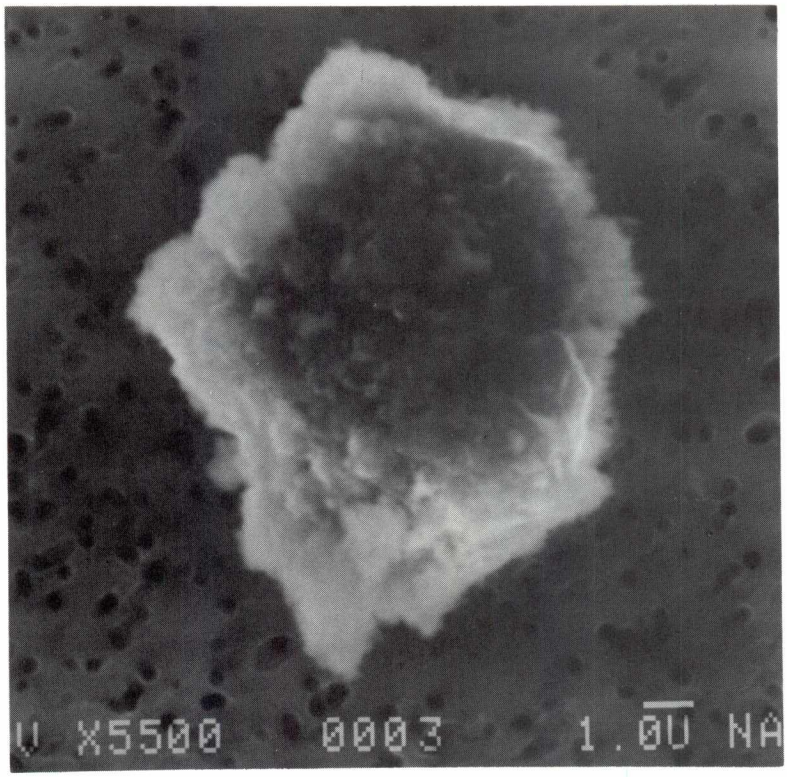
S-92-35919

SIZE: 20x11
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCA

COMMENTS:



L2005 AD 20



S-92-35920

SIZE: 13

SHAPE: S

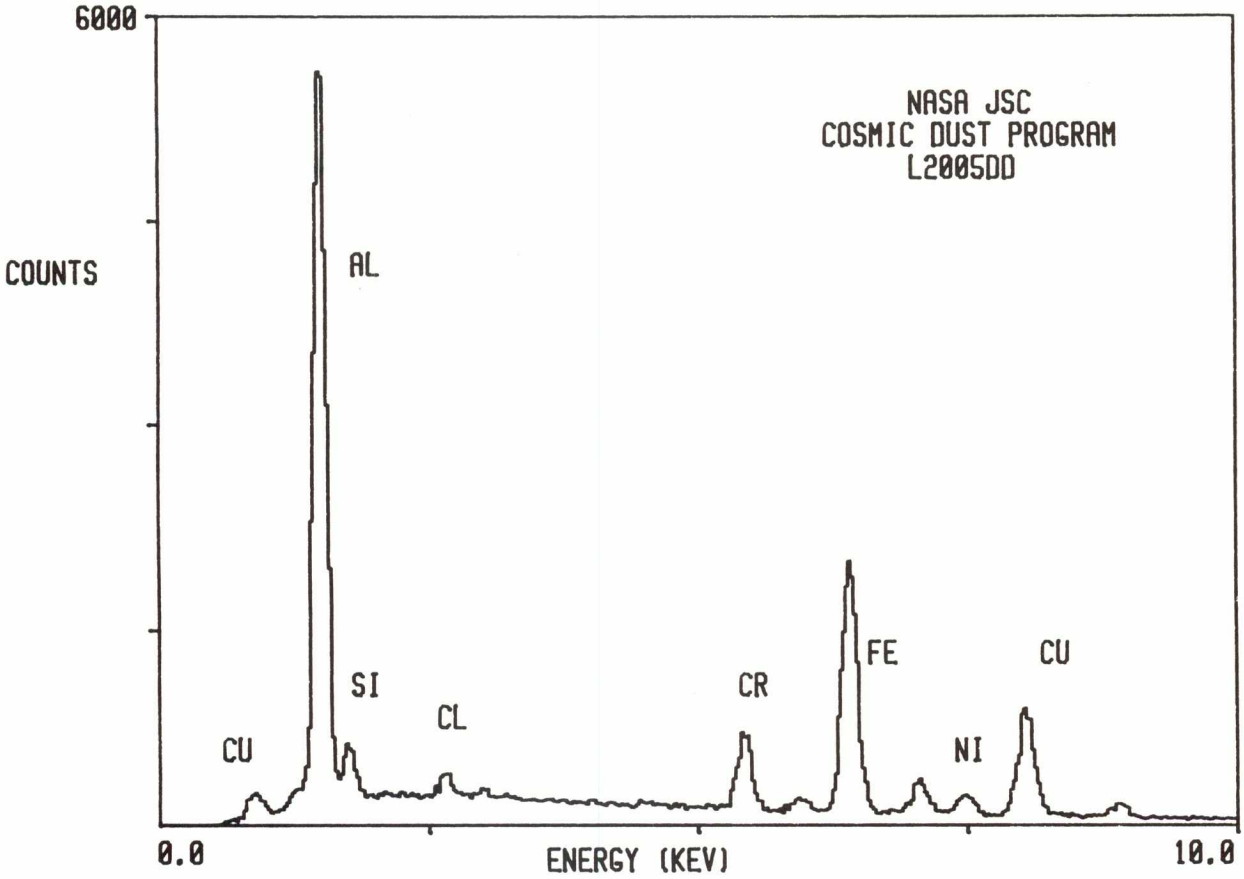
TRANS.: O

COLOR: Black

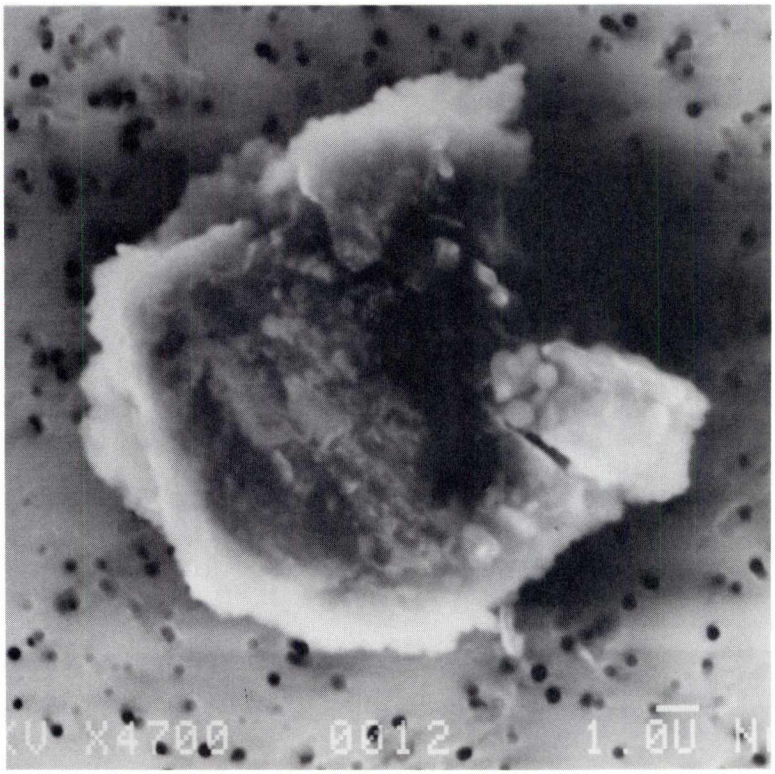
LUSTER: D

TYPE: TCA

COMMENTS:



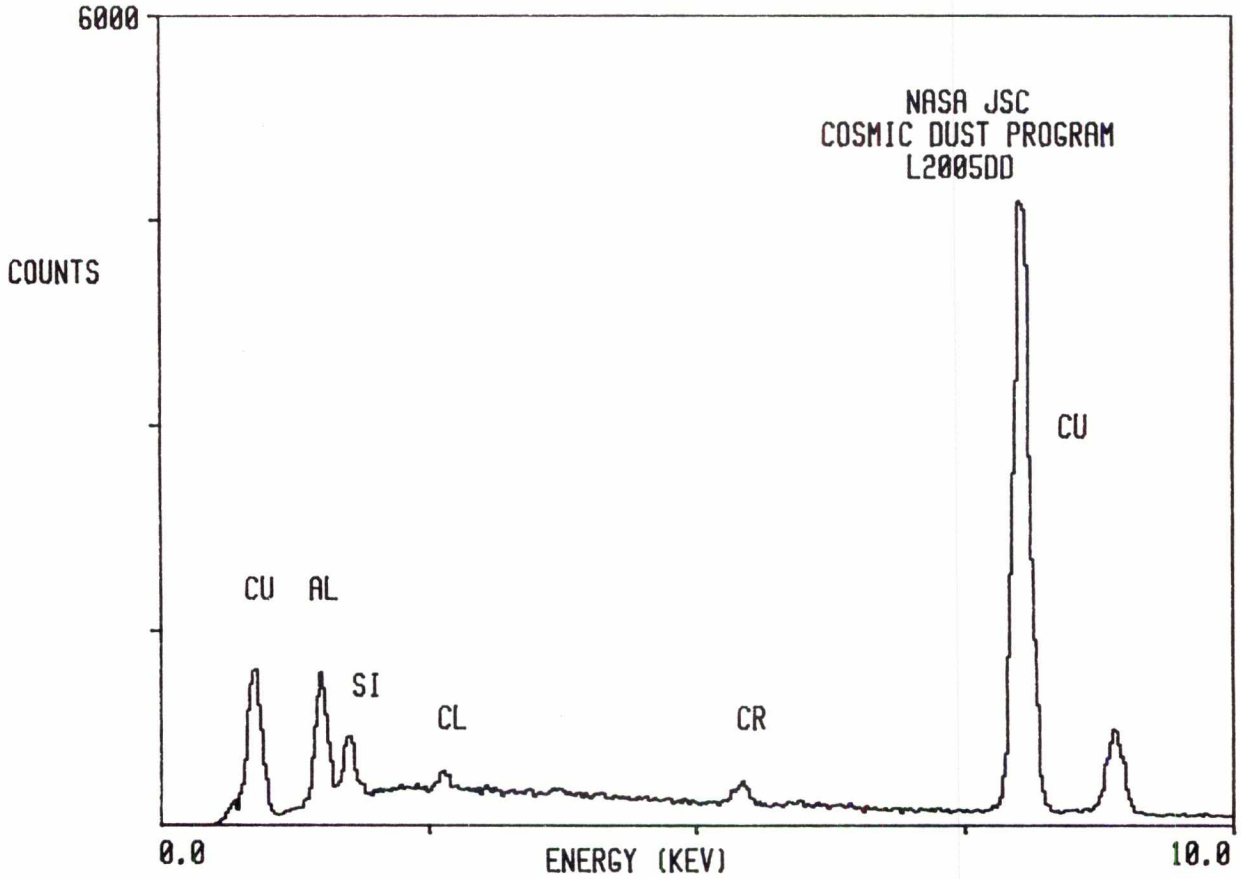
L2005 AD 23



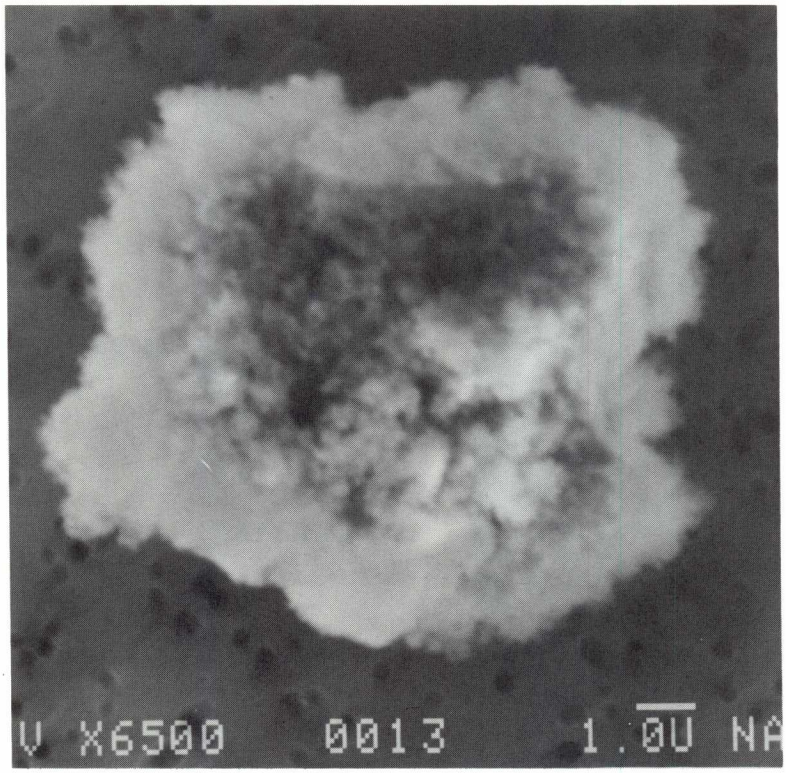
S-92-35923

SIZE: 15x12
SHAPE: E
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA

COMMENTS:



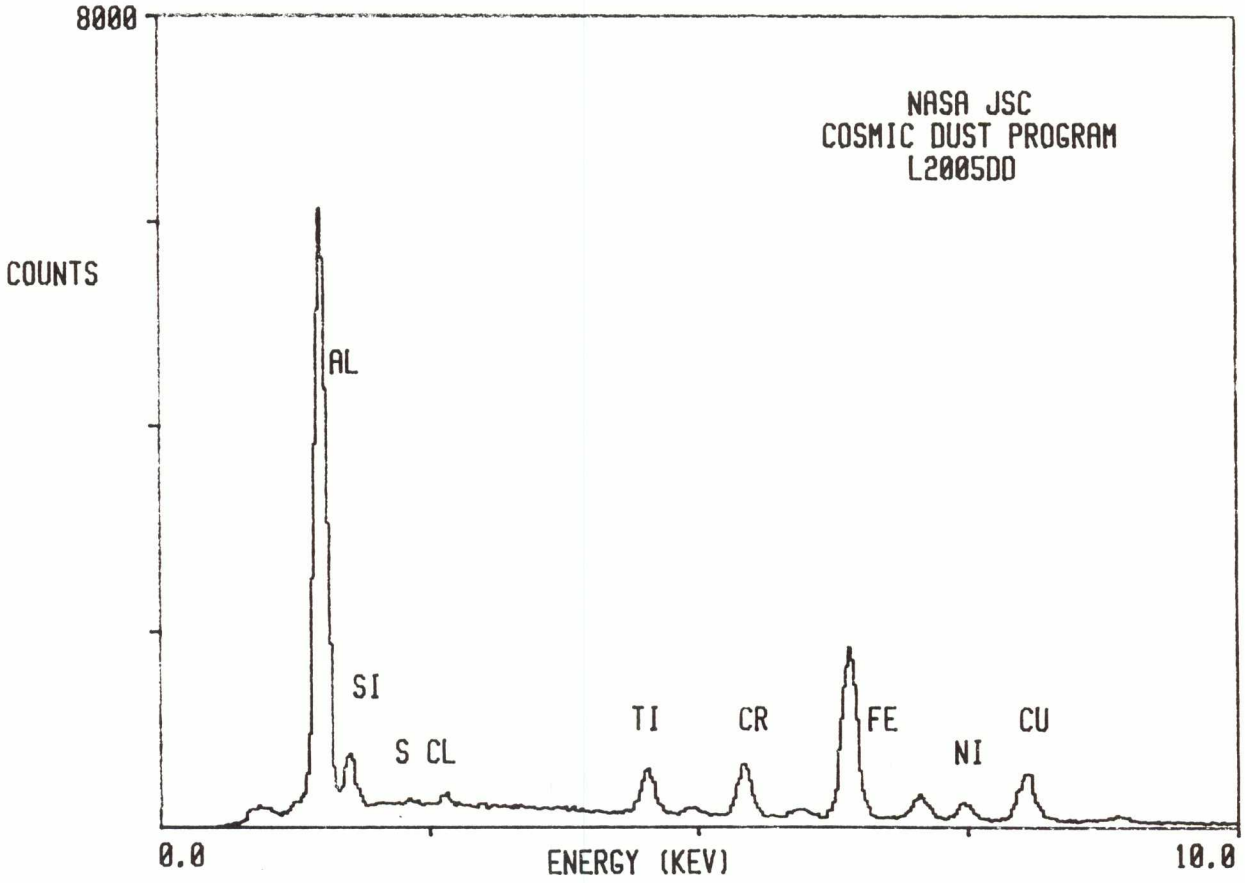
L2005 AD 24



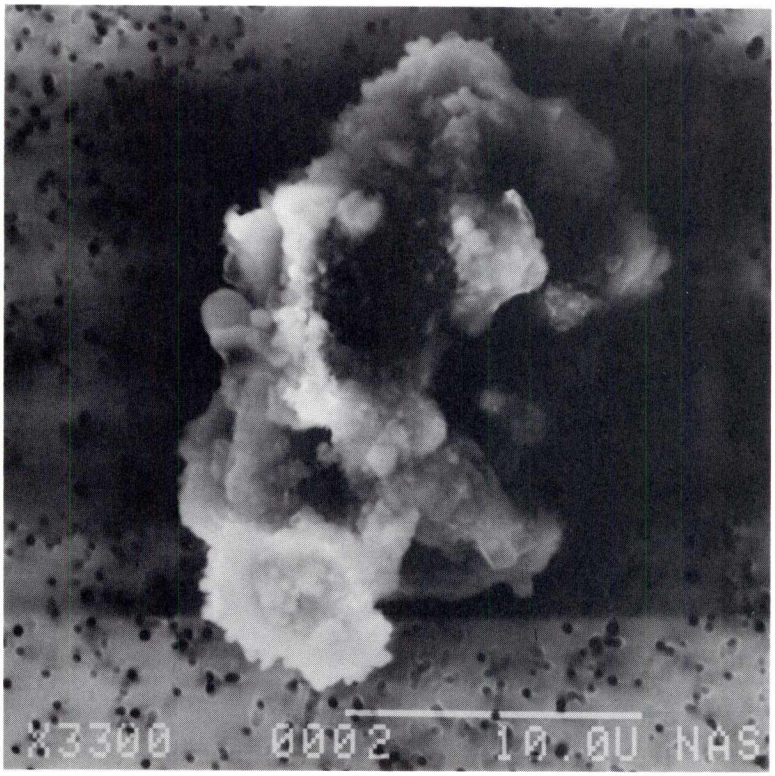
S-92-35924

SIZE: 10
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



L2005 AE 2



S-92-35887

SIZE: 24x15

SHAPE: I

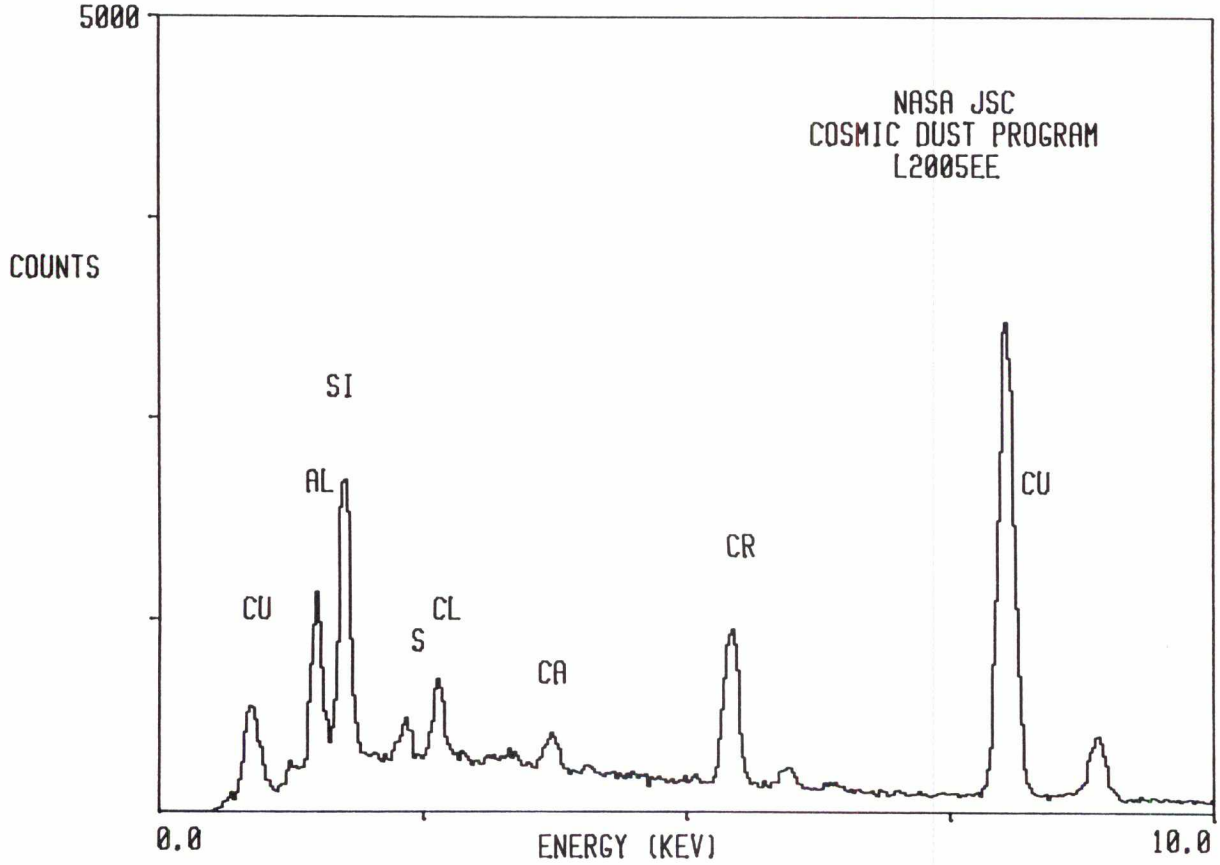
TRANS.: O

COLOR: Colorless to Black

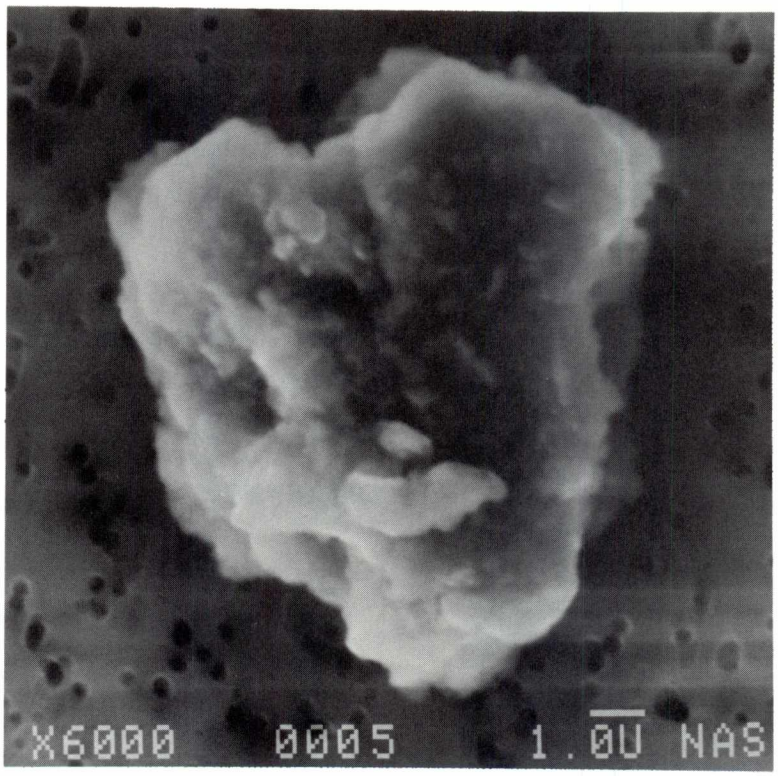
LUSTER: D

TYPE: TCA

COMMENTS:



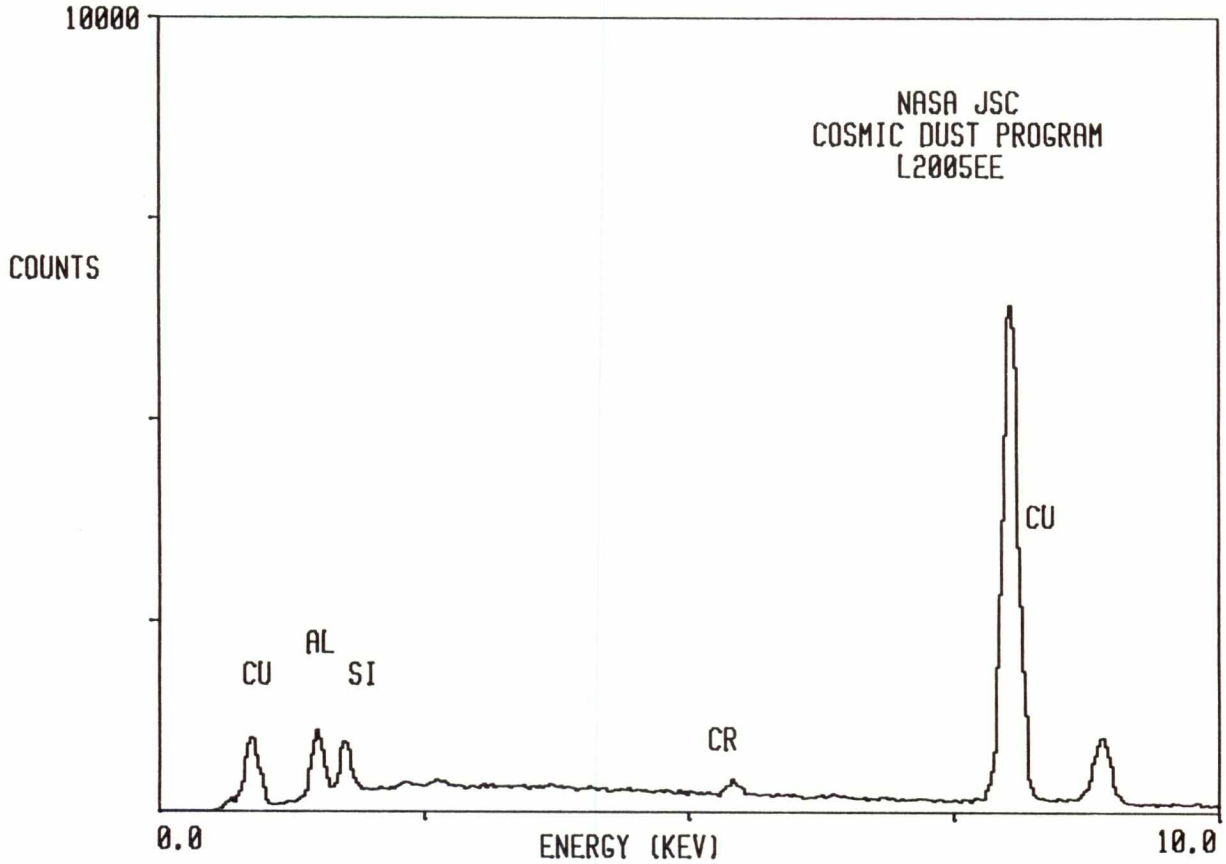
L2005 AE 3



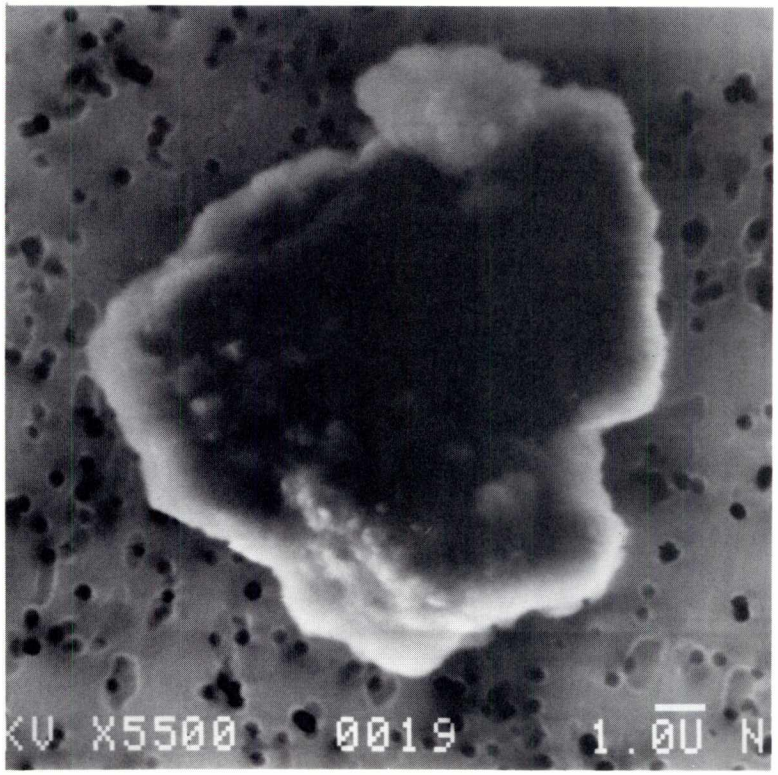
S-92-35888

SIZE: 12x10
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCA

COMMENTS:



L2005 AE 9



S-92-35894

SIZE: 12x10

SHAPE: I

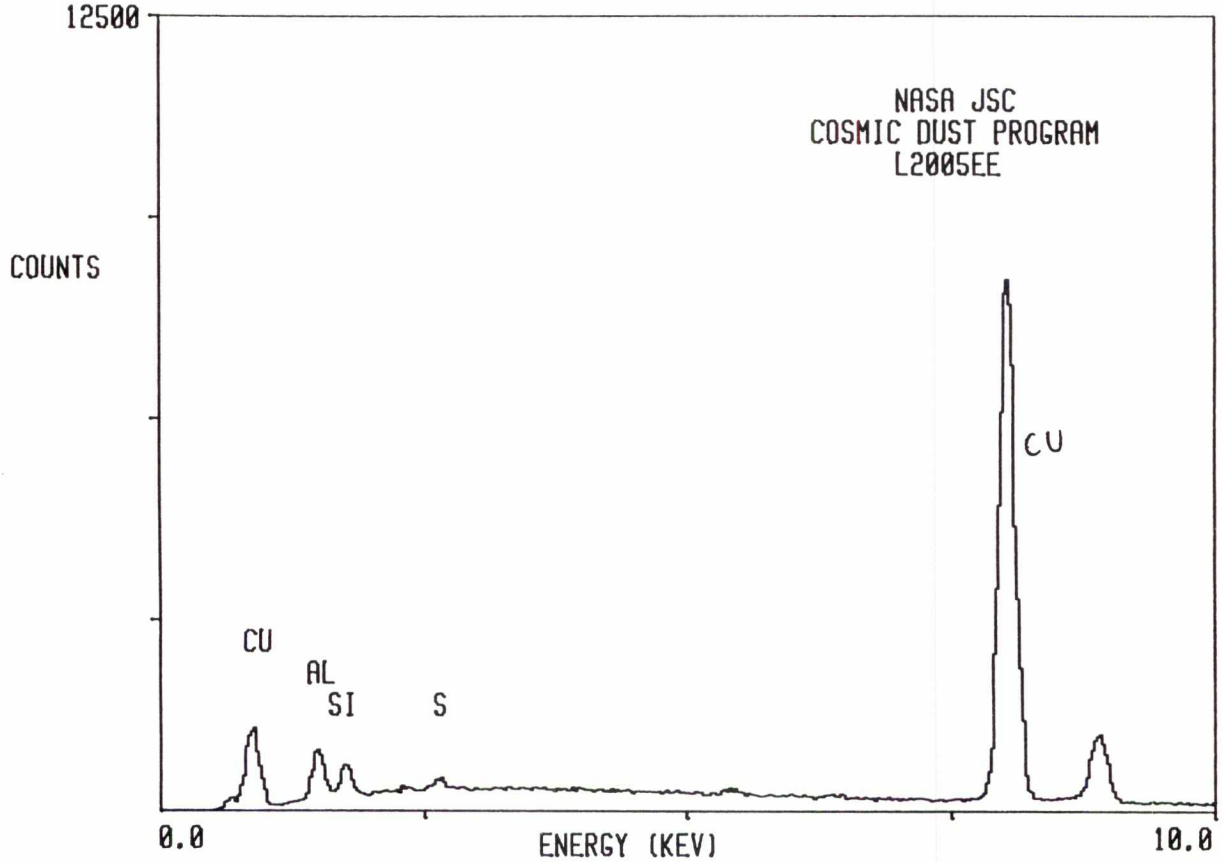
TRANS.: O

COLOR: White to Black

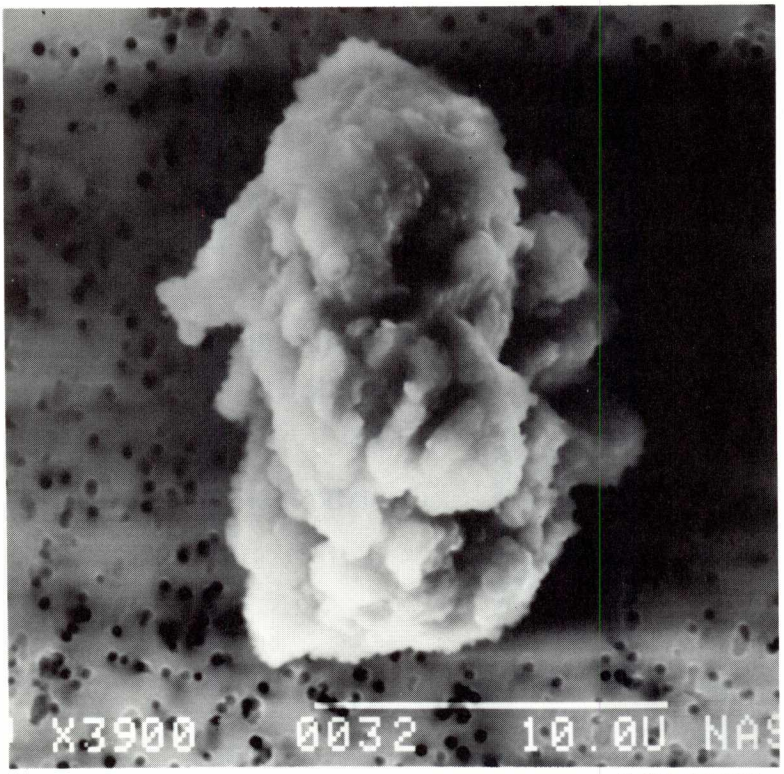
LUSTER: M

TYPE: TCA

COMMENTS:



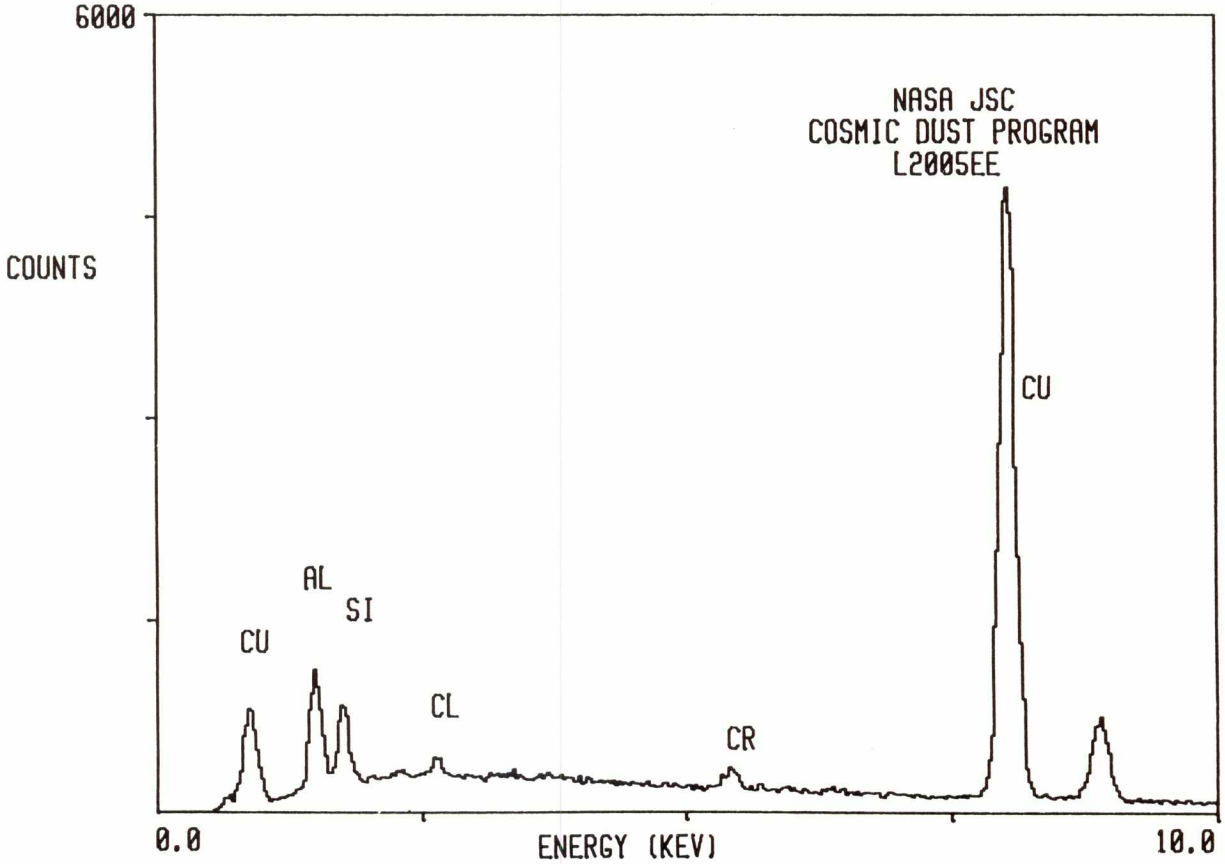
L2005 AE 13



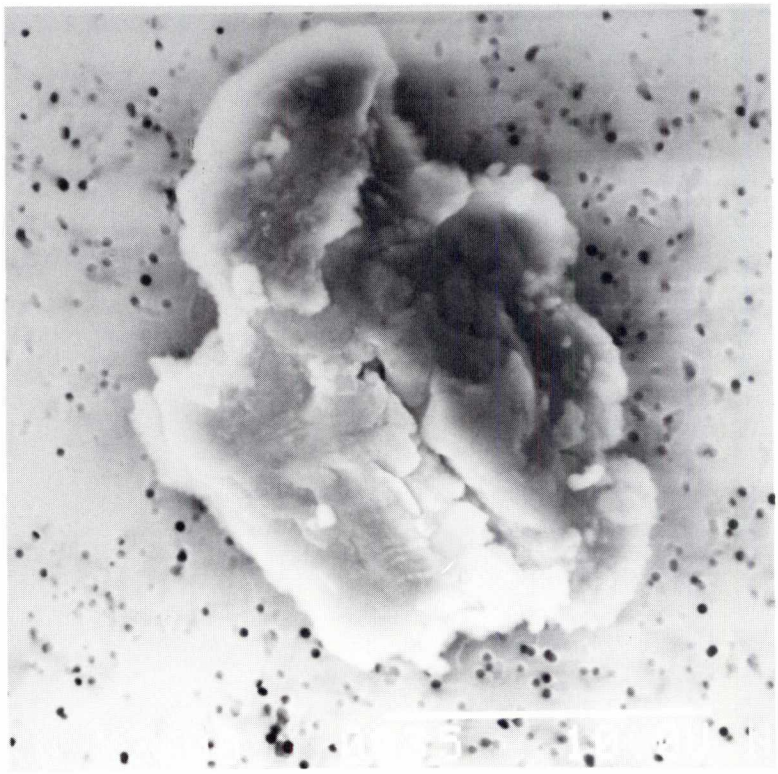
S-92-35897

SIZE: 17x15
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



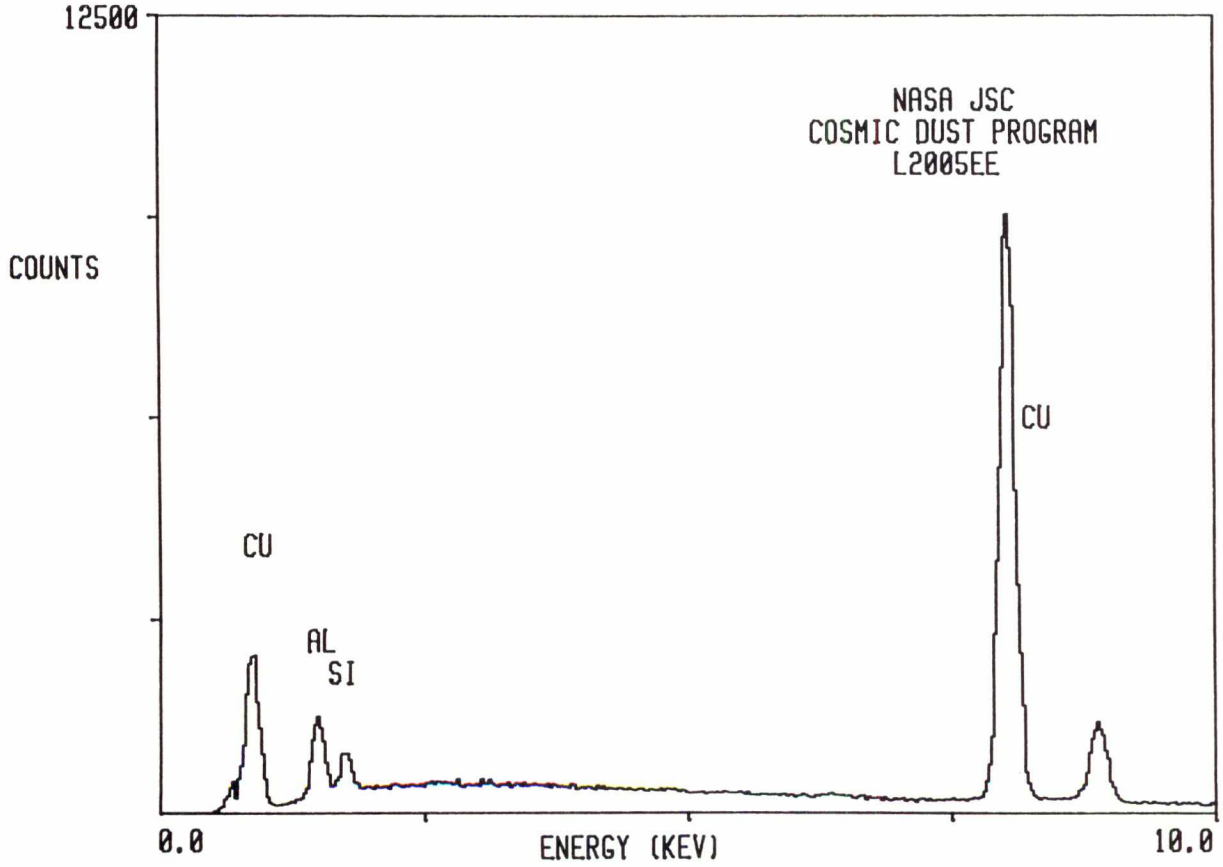
L2005 AE 15



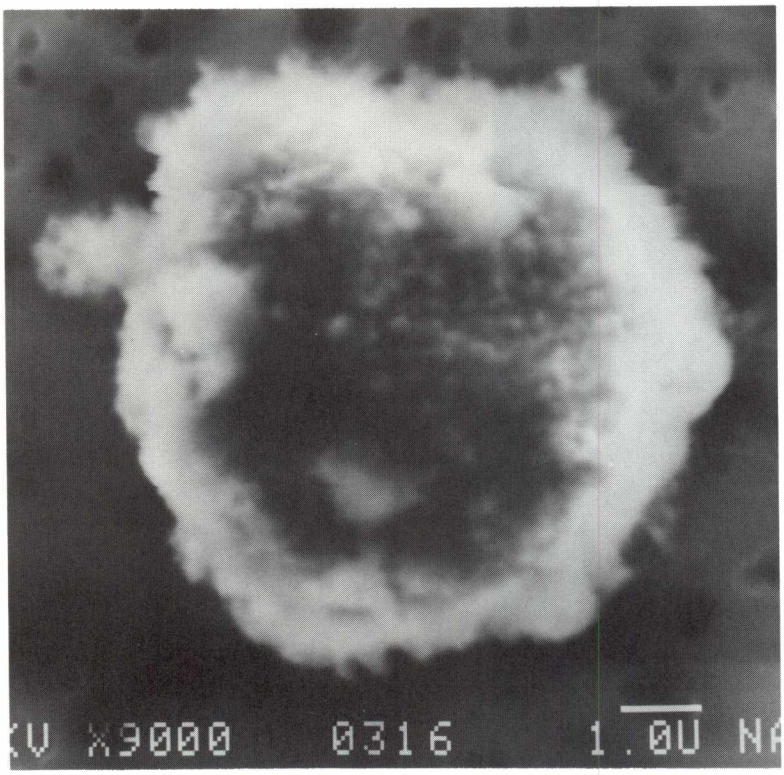
S-92-35899

SIZE: 18x15
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCA

COMMENTS:



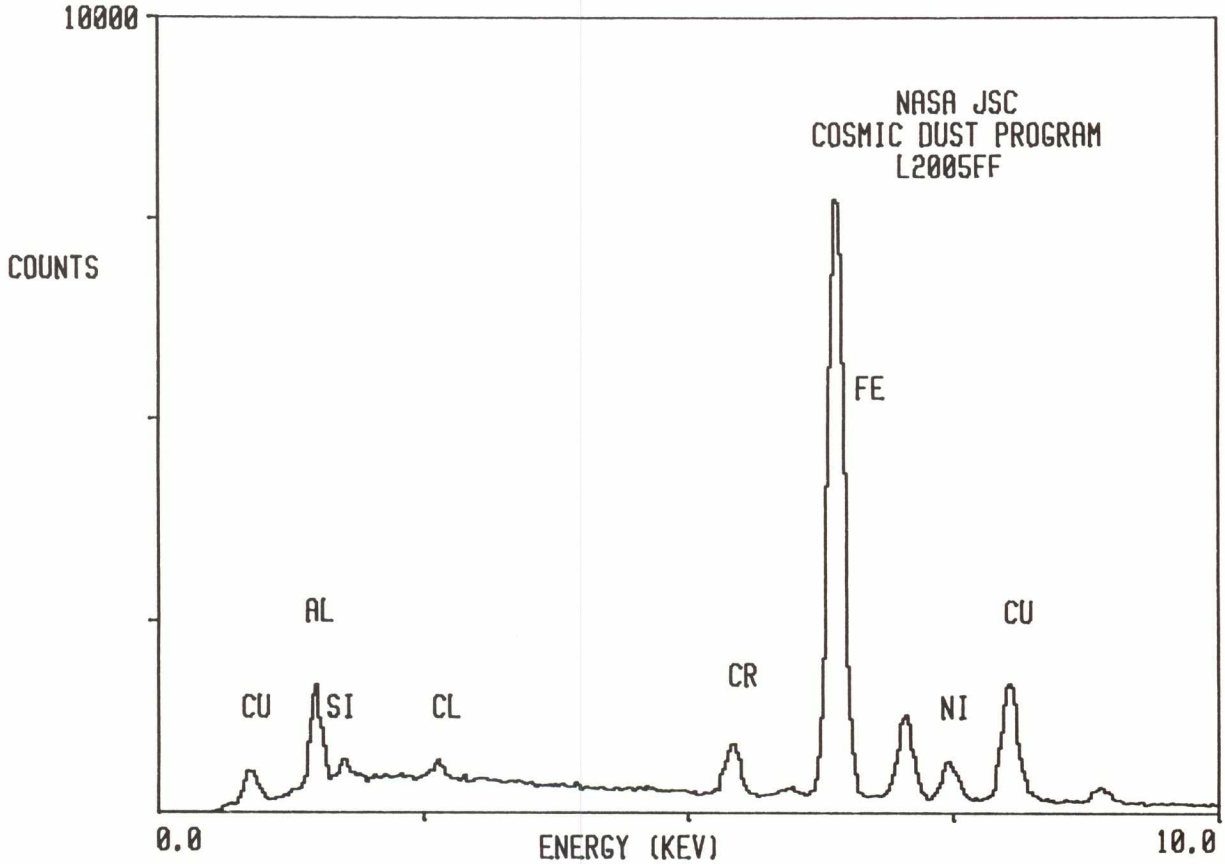
L2005 AF 1



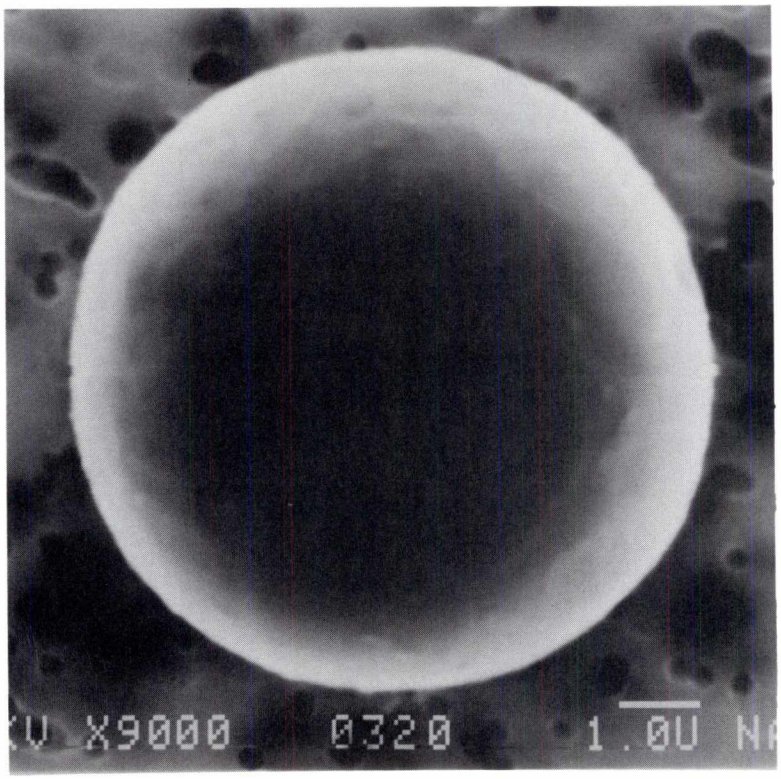
S-92-35380

SIZE: 8
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: TCA

COMMENTS:



L2005 AF 2



S-92-35381

SIZE: 7

SHAPE: S

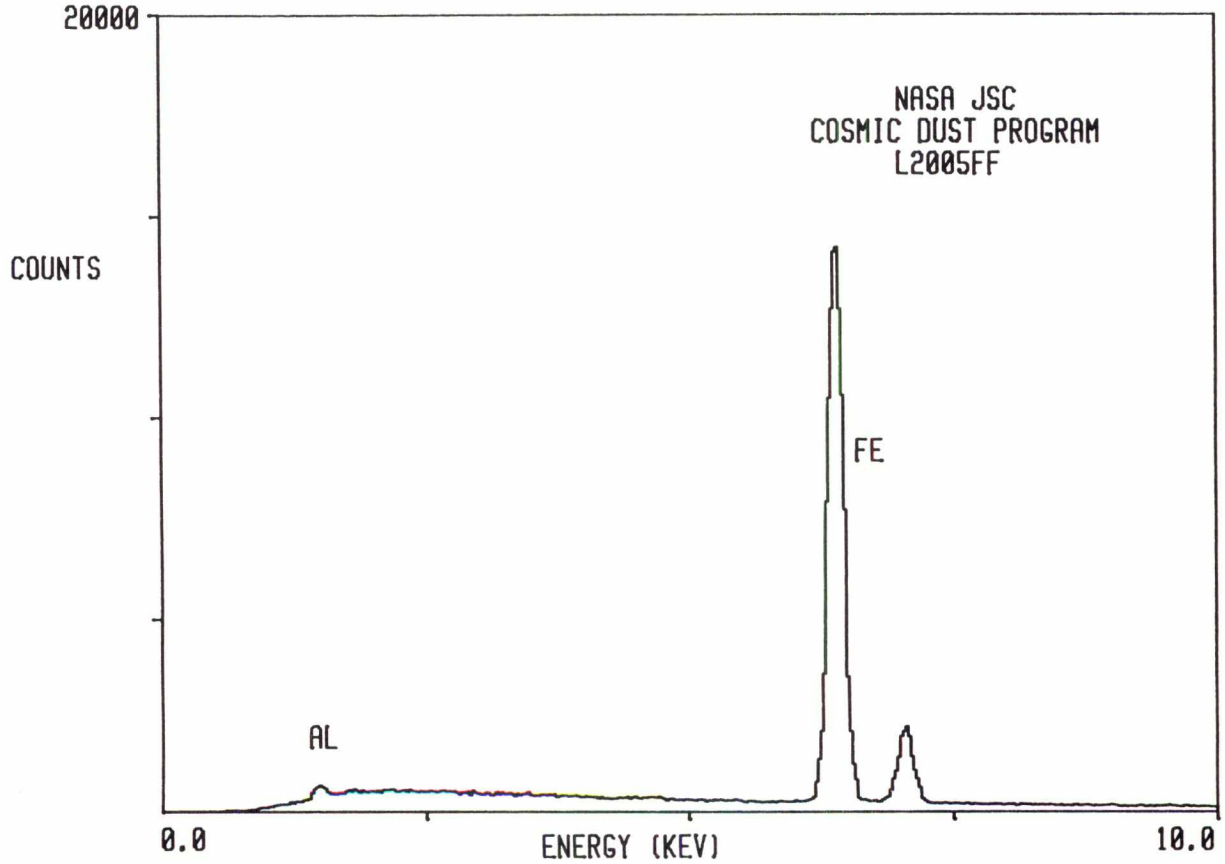
TRANS.: O

COLOR: Black

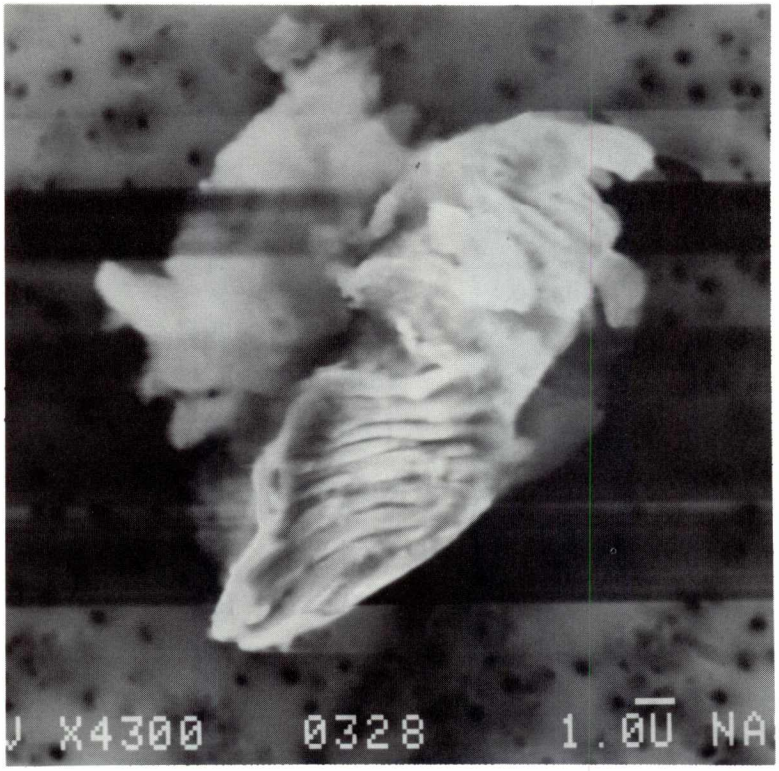
LUSTER: M

TYPE: TCA?

COMMENTS:



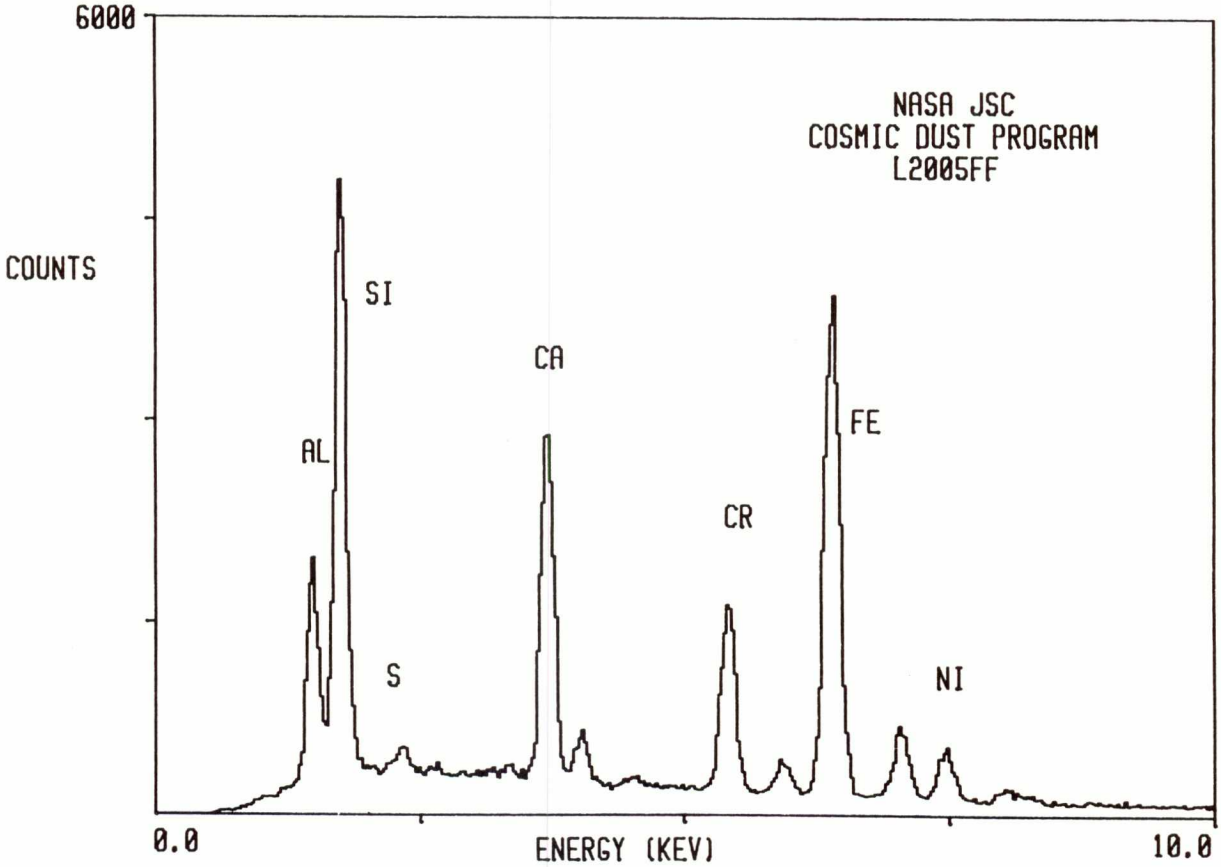
L2005 AF 4



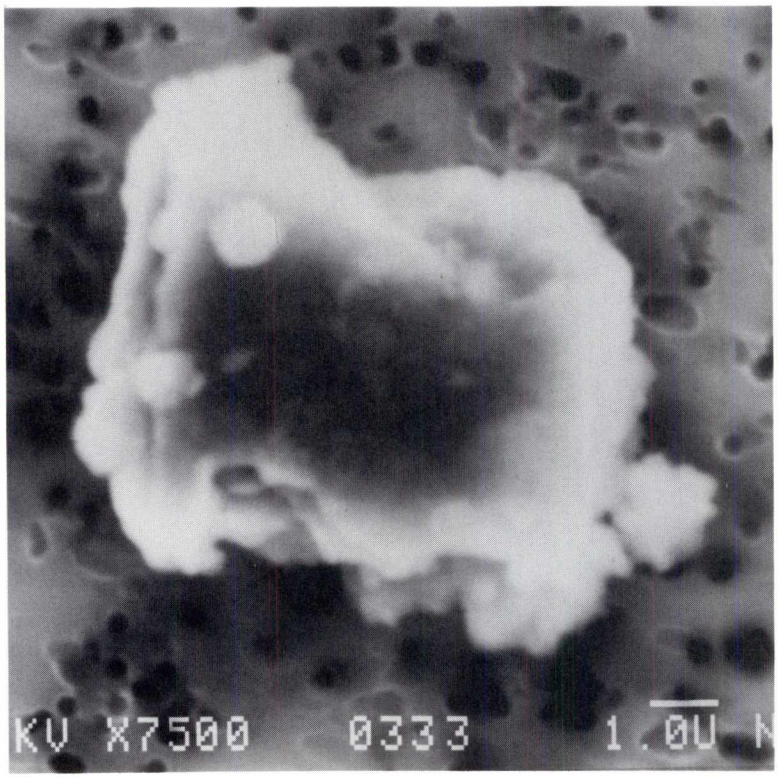
S-92-35383

SIZE: 17x16
SHAPE: I
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA?

COMMENTS:



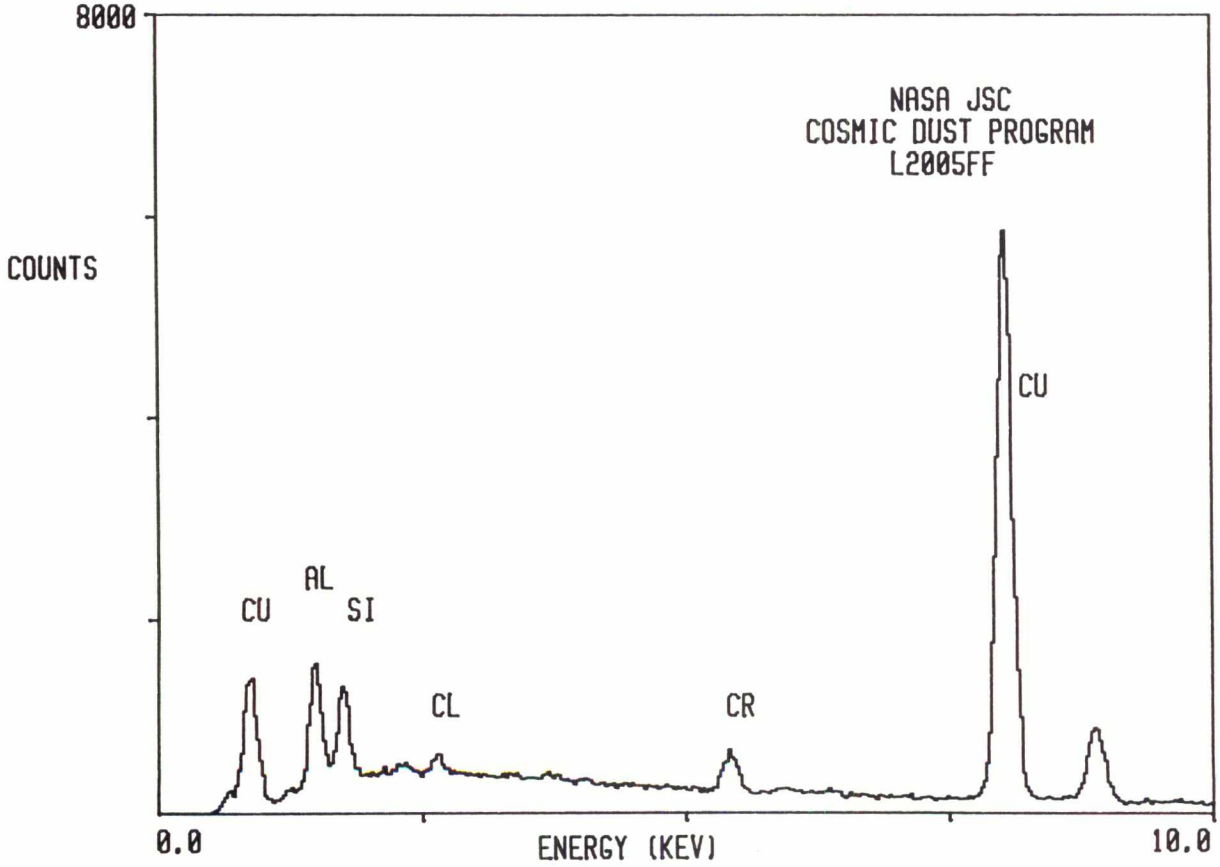
L2005 AF 6



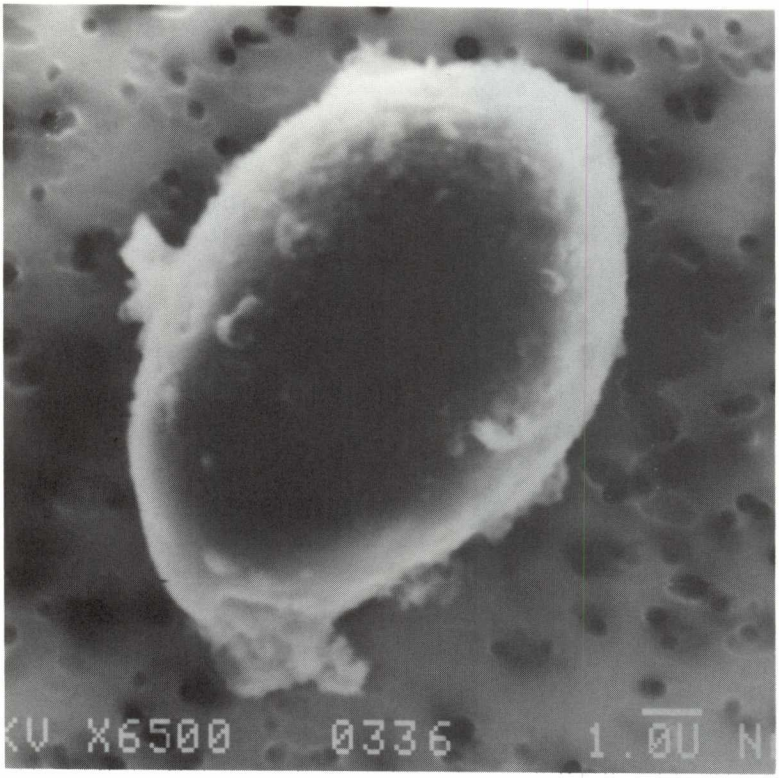
S-92-35385

SIZE: 10x8
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: TCA

COMMENTS:



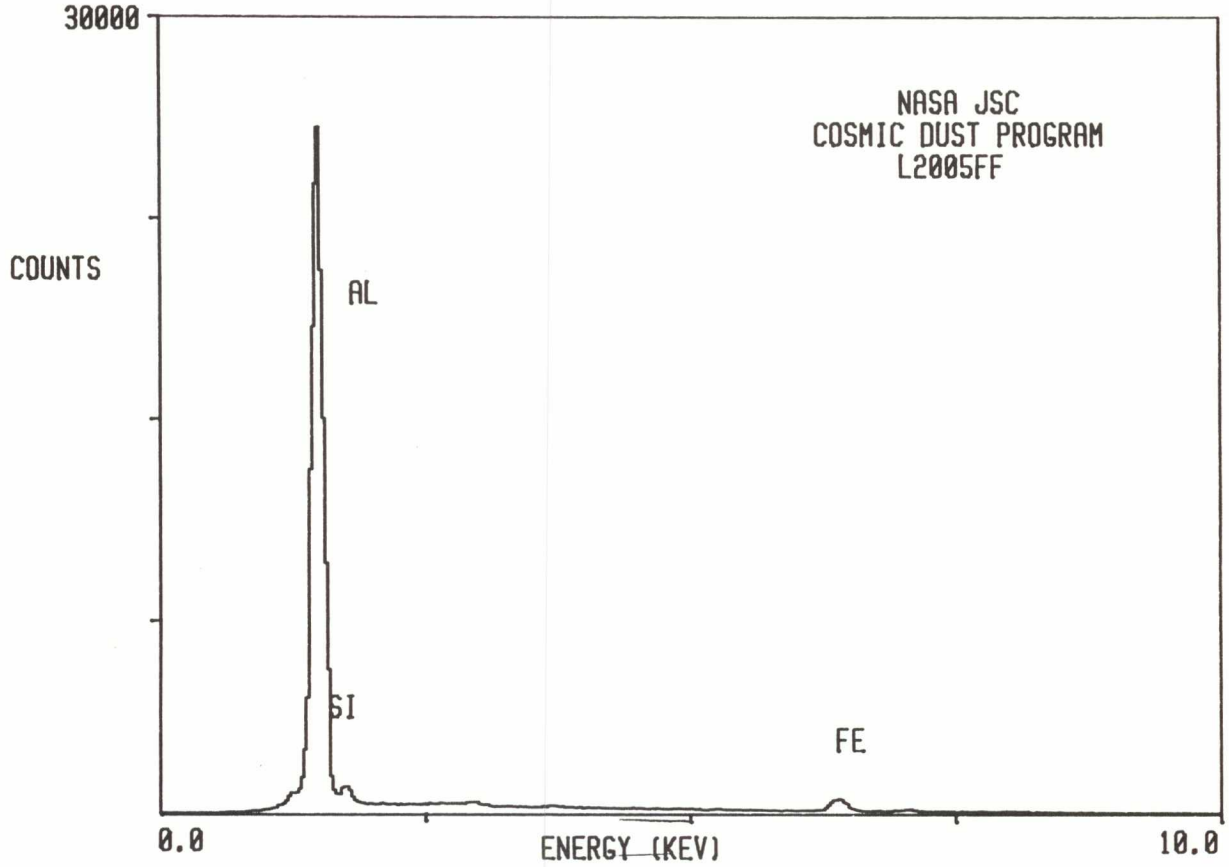
L2005 AF 8



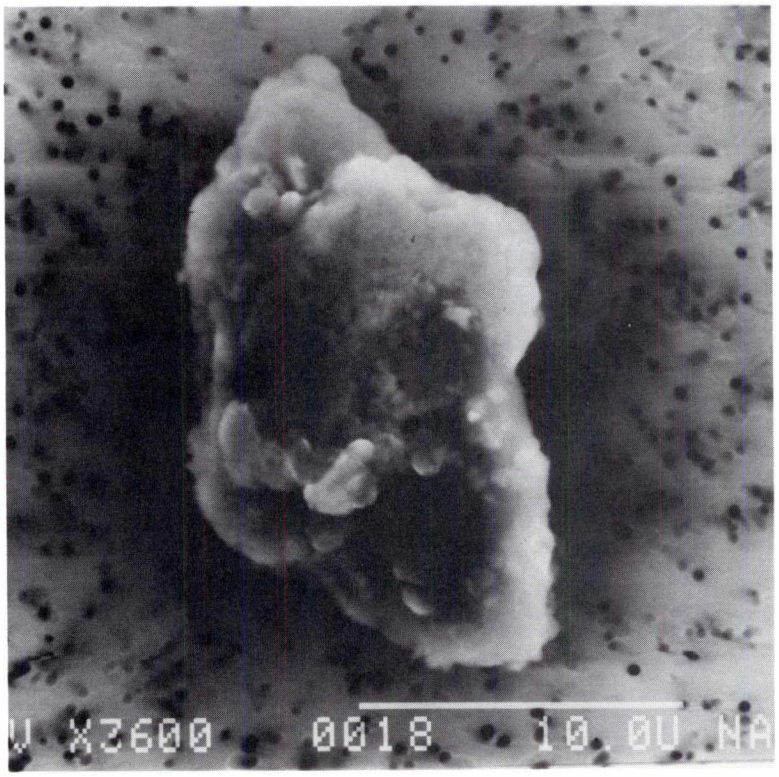
S-92-35387

SIZE: 12x10
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



L2005 AF 15



S-92-35394

SIZE: 19x11

SHAPE: E

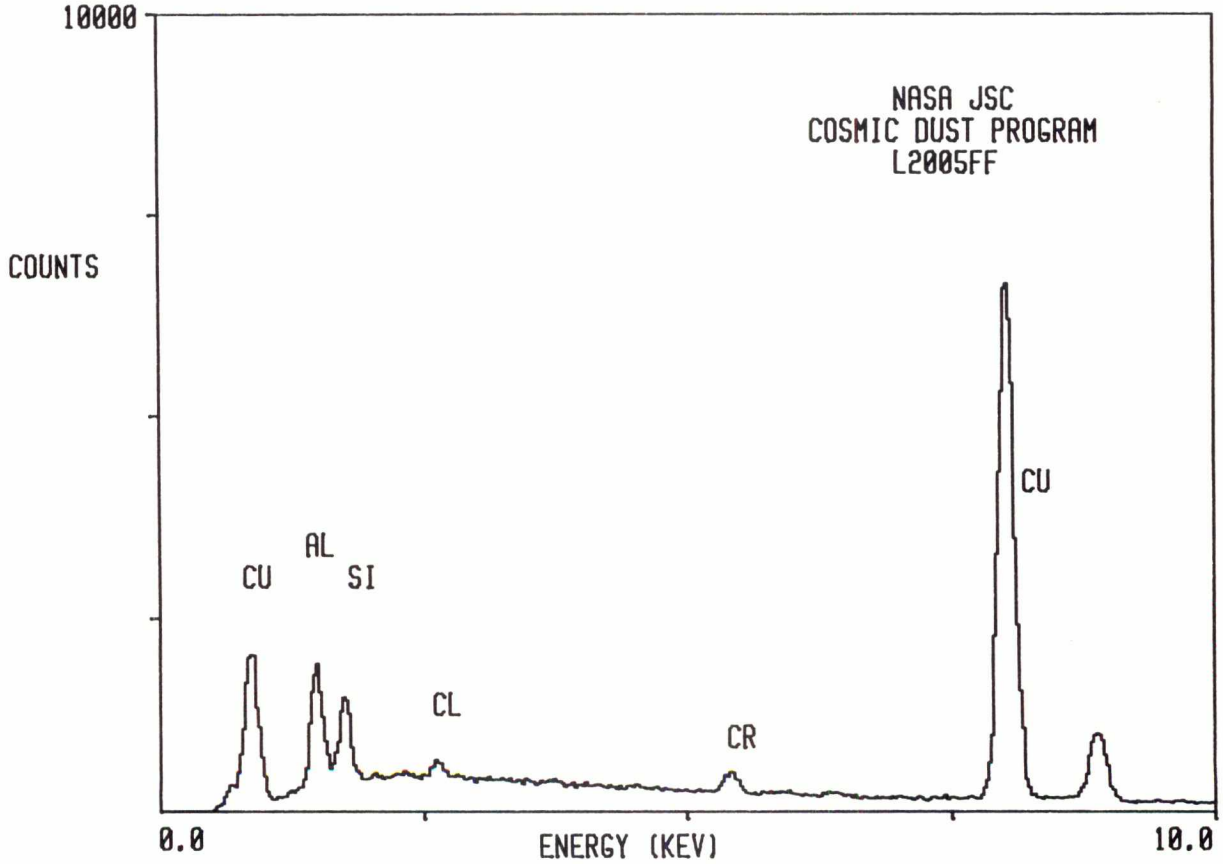
TRANS.: O

COLOR: Silver to Brown

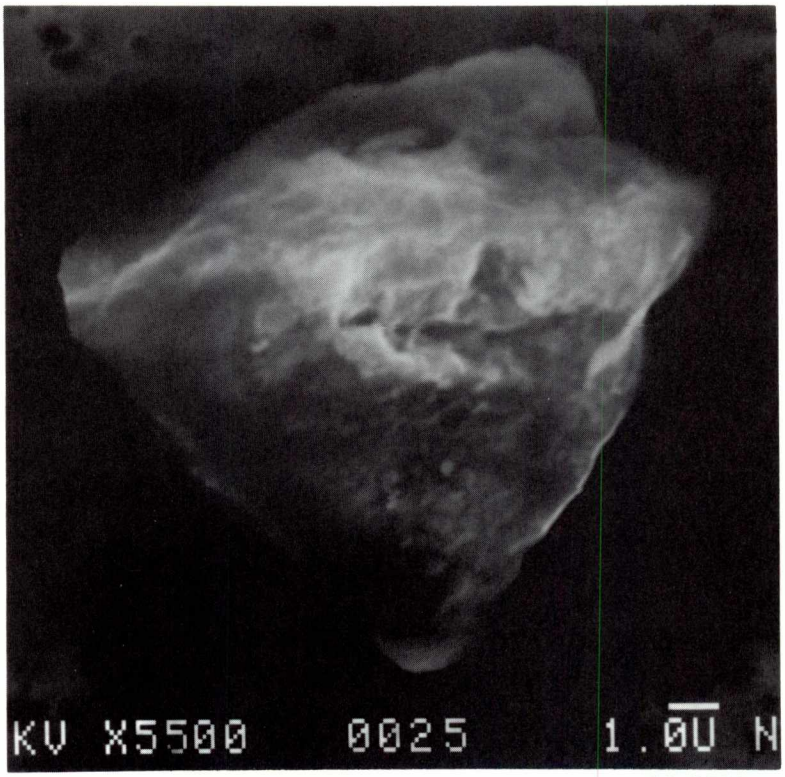
LUSTER: M

TYPE: TCA

COMMENTS:



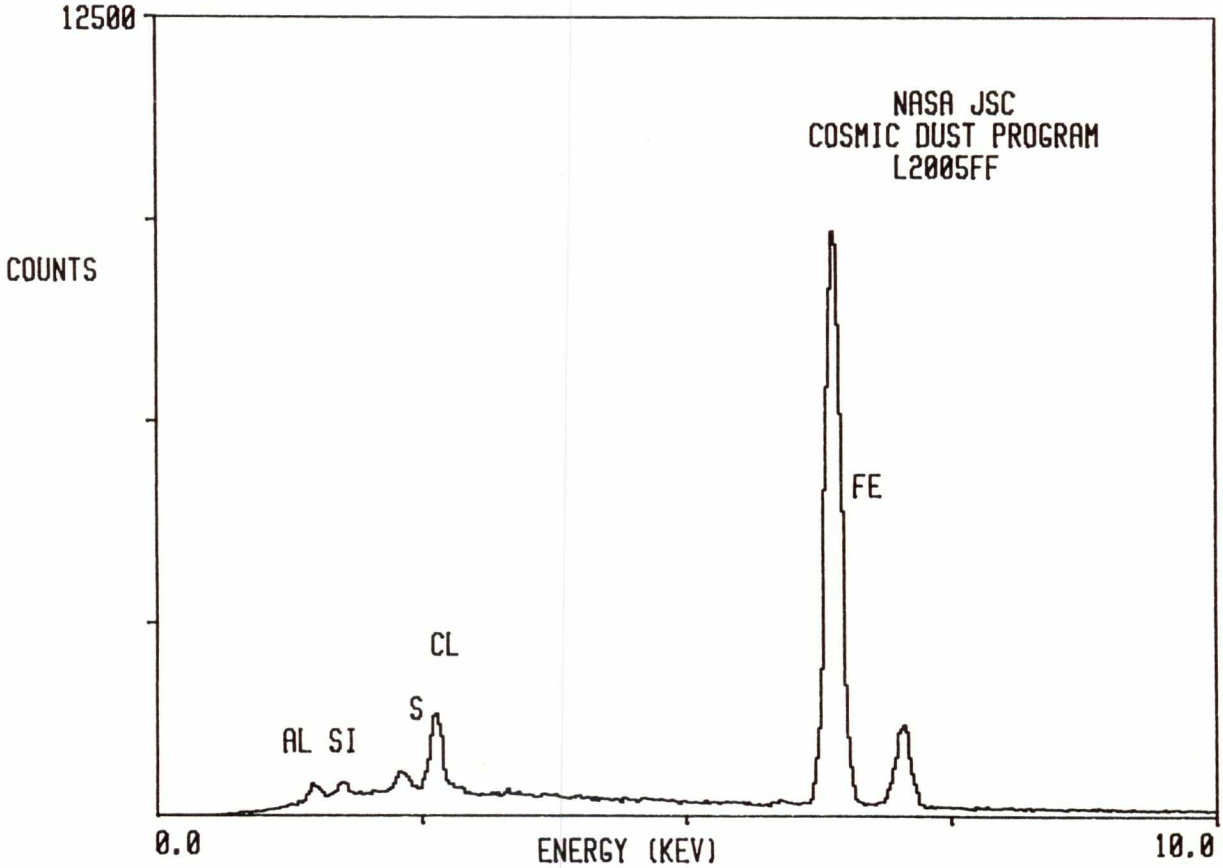
L2005 AF 16



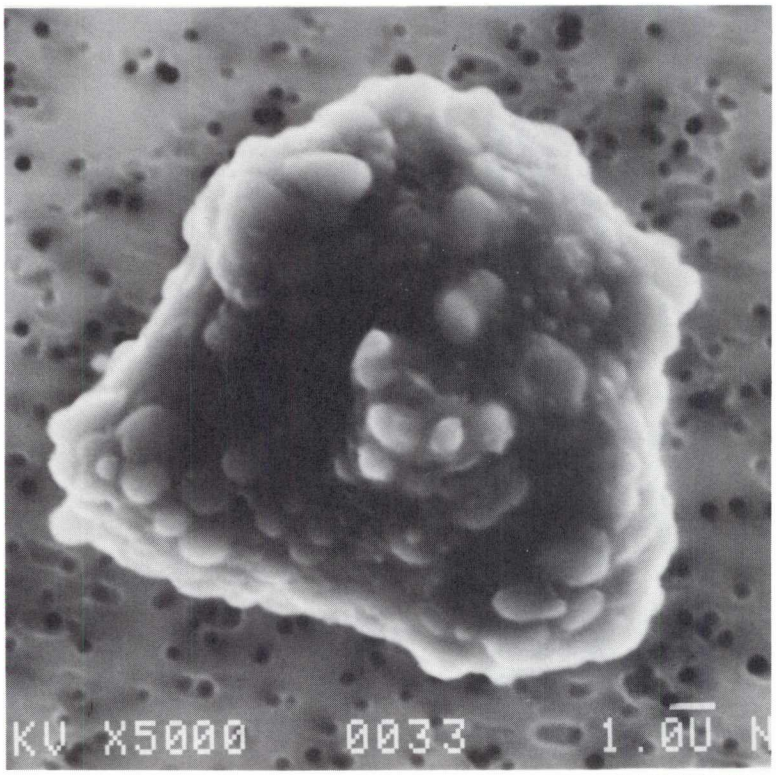
S-92-35395

SIZE: 12x10
SHAPE: E
TRANS.: TL
COLOR: Red
LUSTER: SM
TYPE: TCA?

COMMENTS:



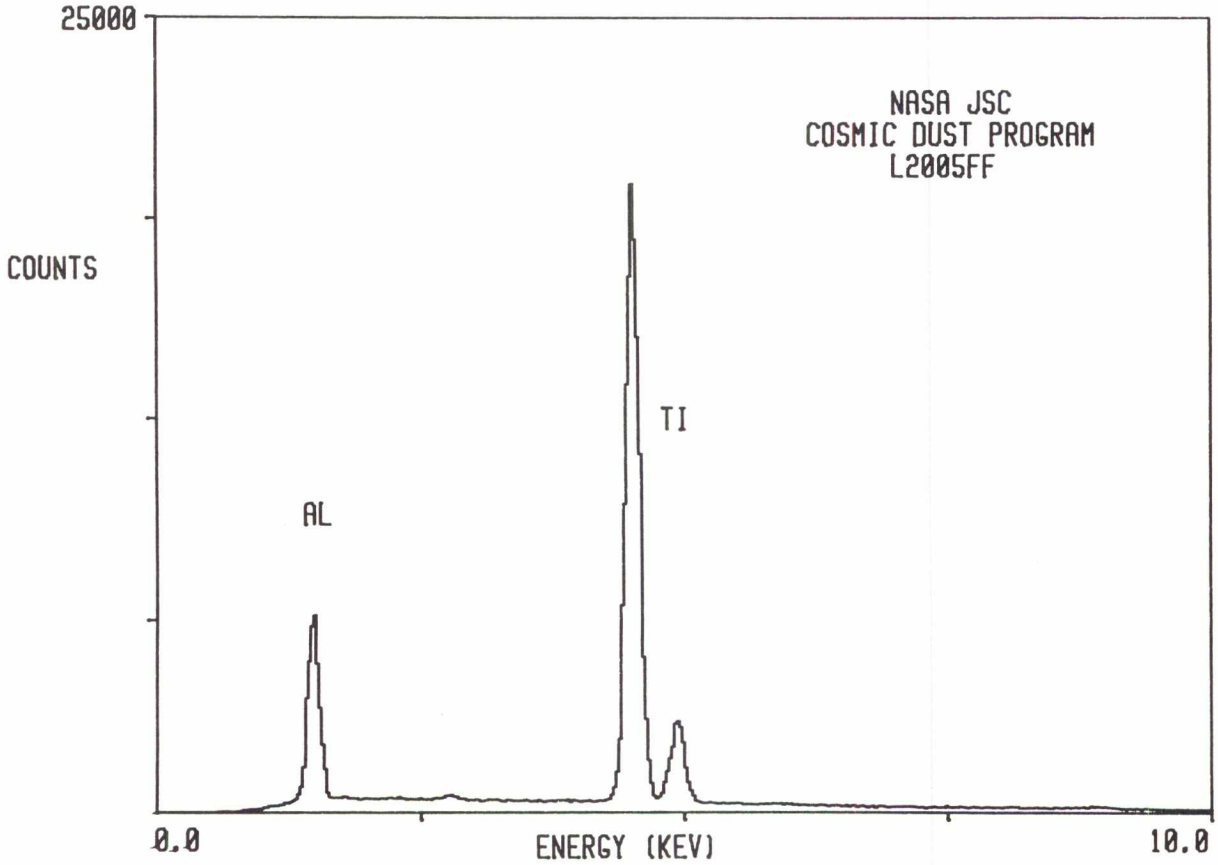
L2005 AF 18



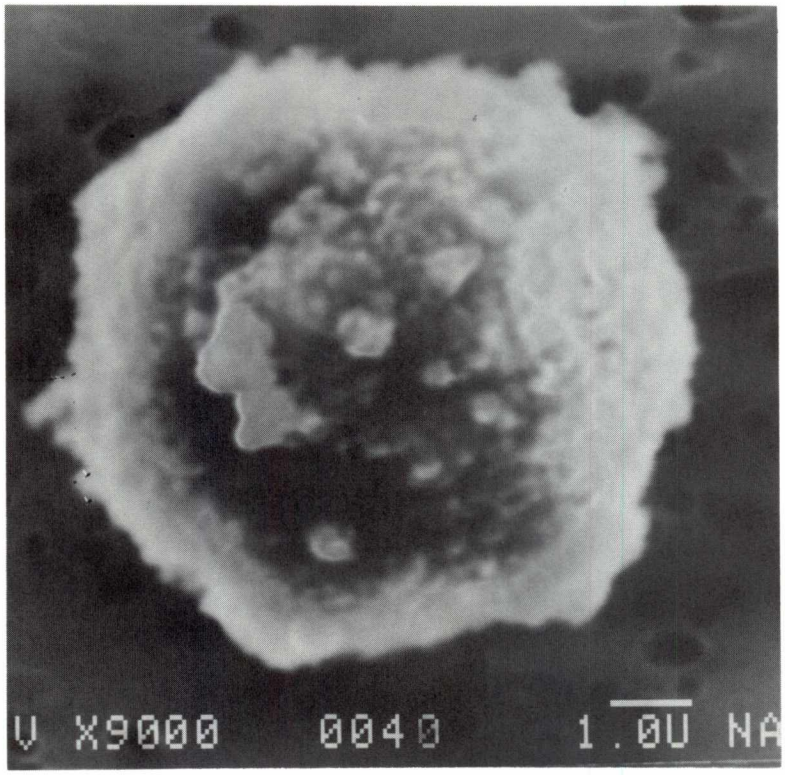
S-92-35397

SIZE: 12x10
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



L2005 AG 3



S-92-35365

SIZE: 8

SHAPE: S

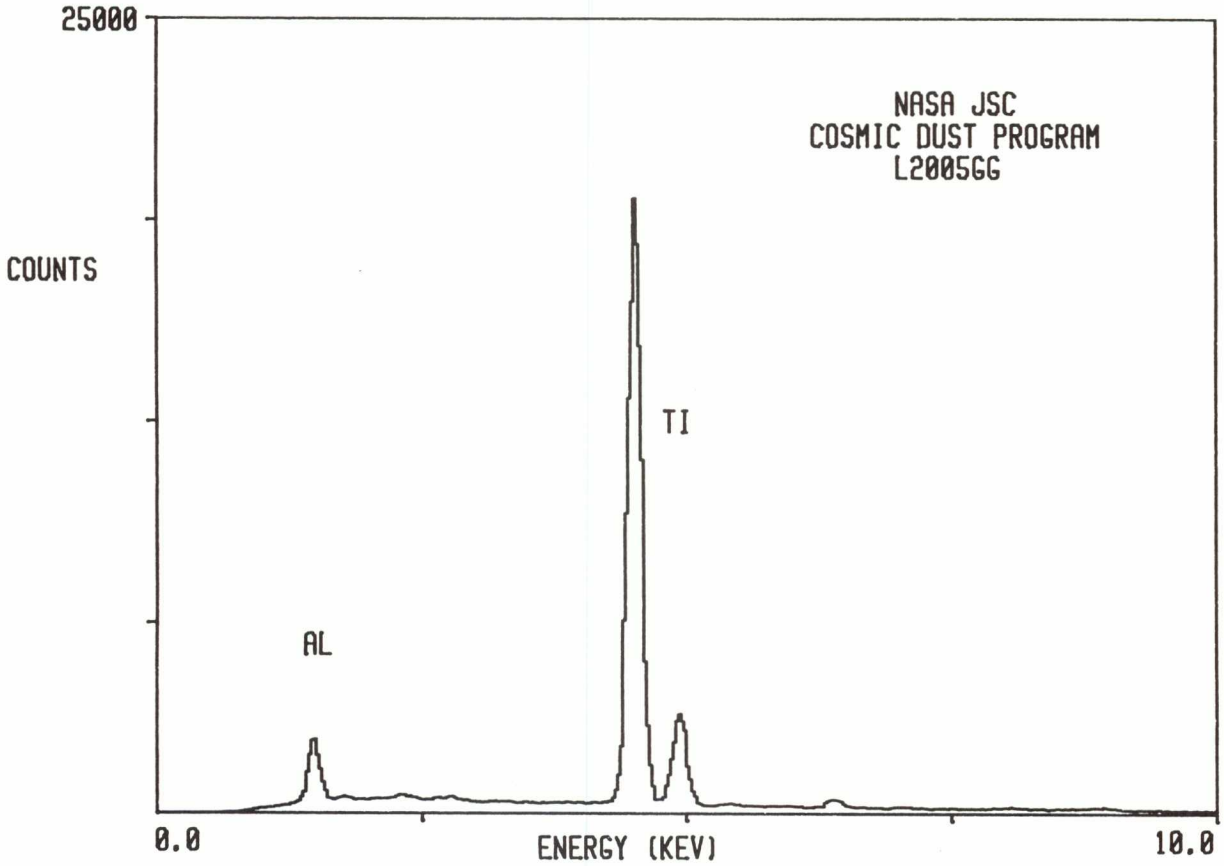
TRANS.: O

COLOR: Black

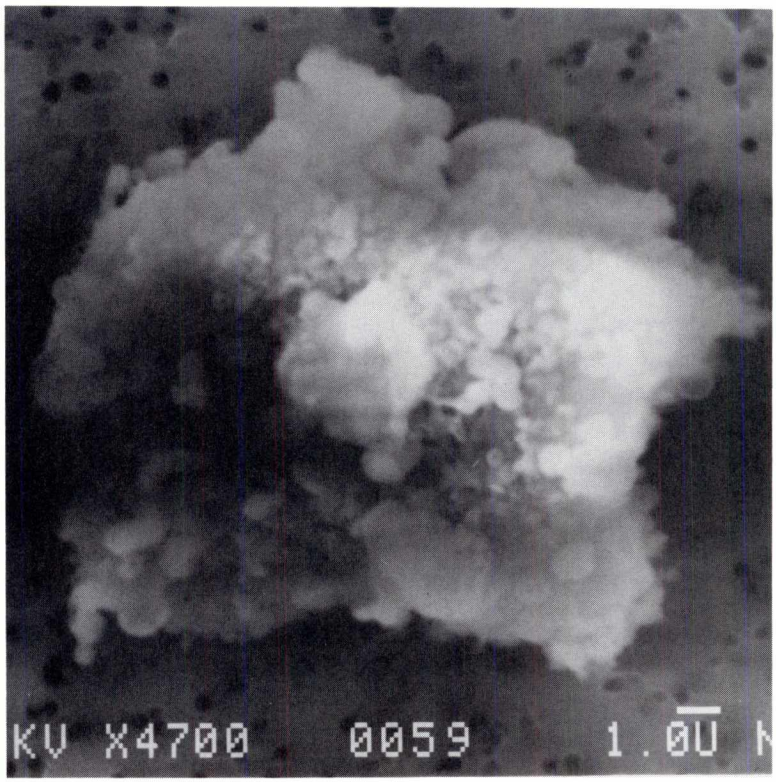
LUSTER: D

TYPE: TCA

COMMENTS:



L2005 AG 10



S-92-35372

SIZE: 15x11

SHAPE: E

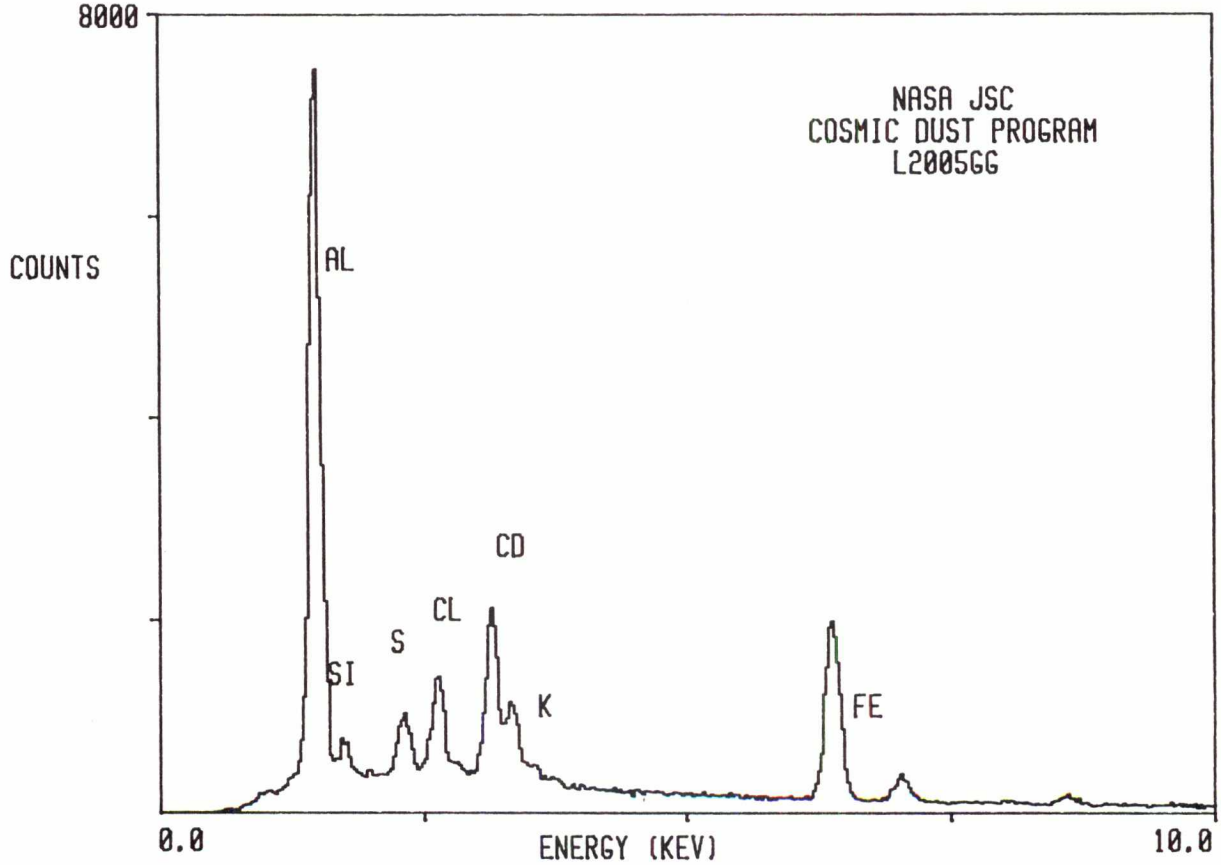
TRANS.: O

COLOR: Silver

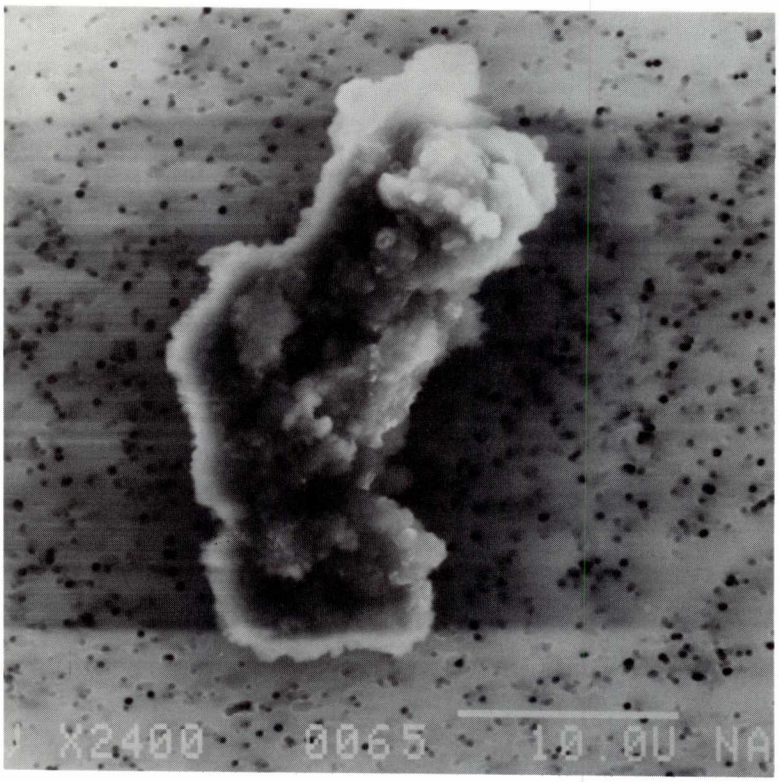
LUSTER: M

TYPE: TCA

COMMENTS:



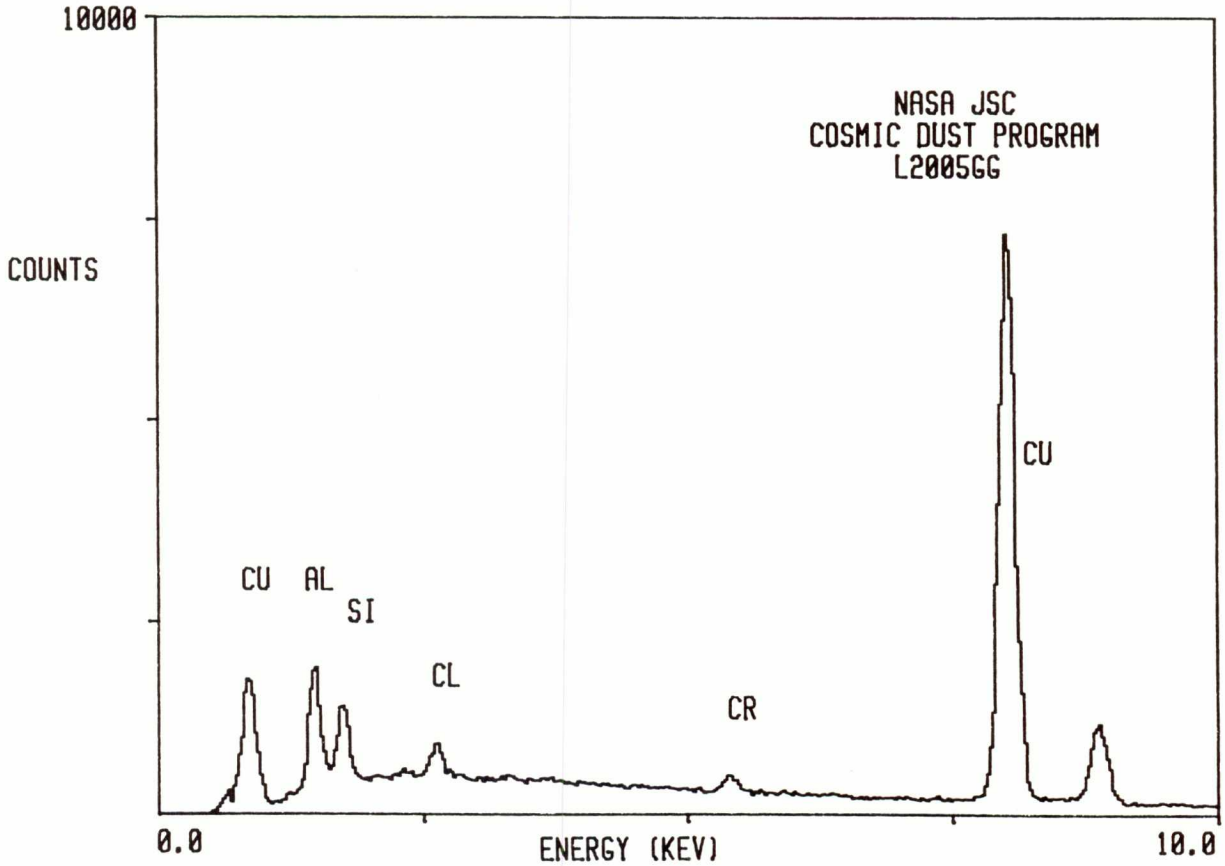
L2005 AG 12



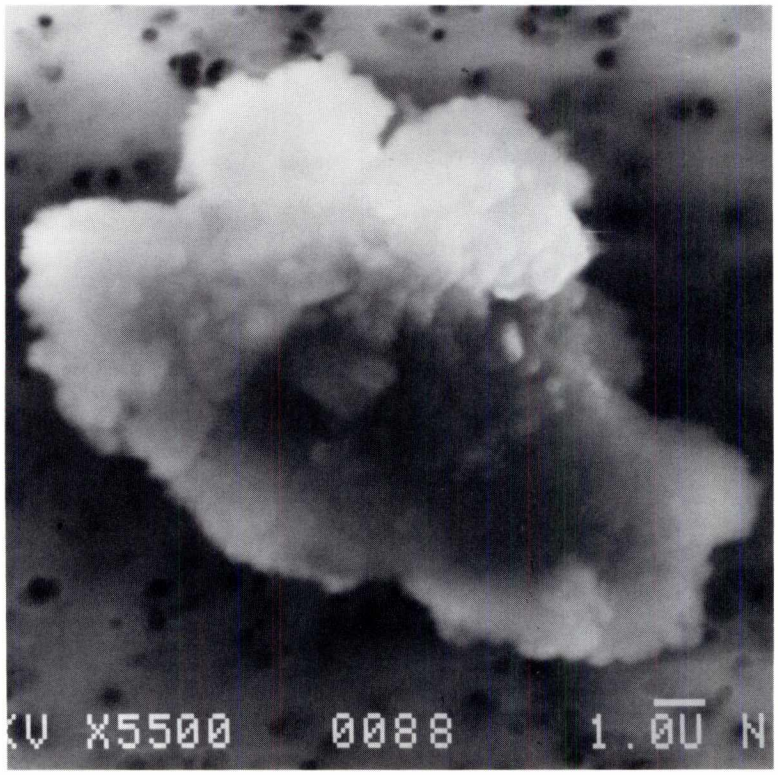
S-92-35374

SIZE: 26x10
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: TCA

COMMENTS:



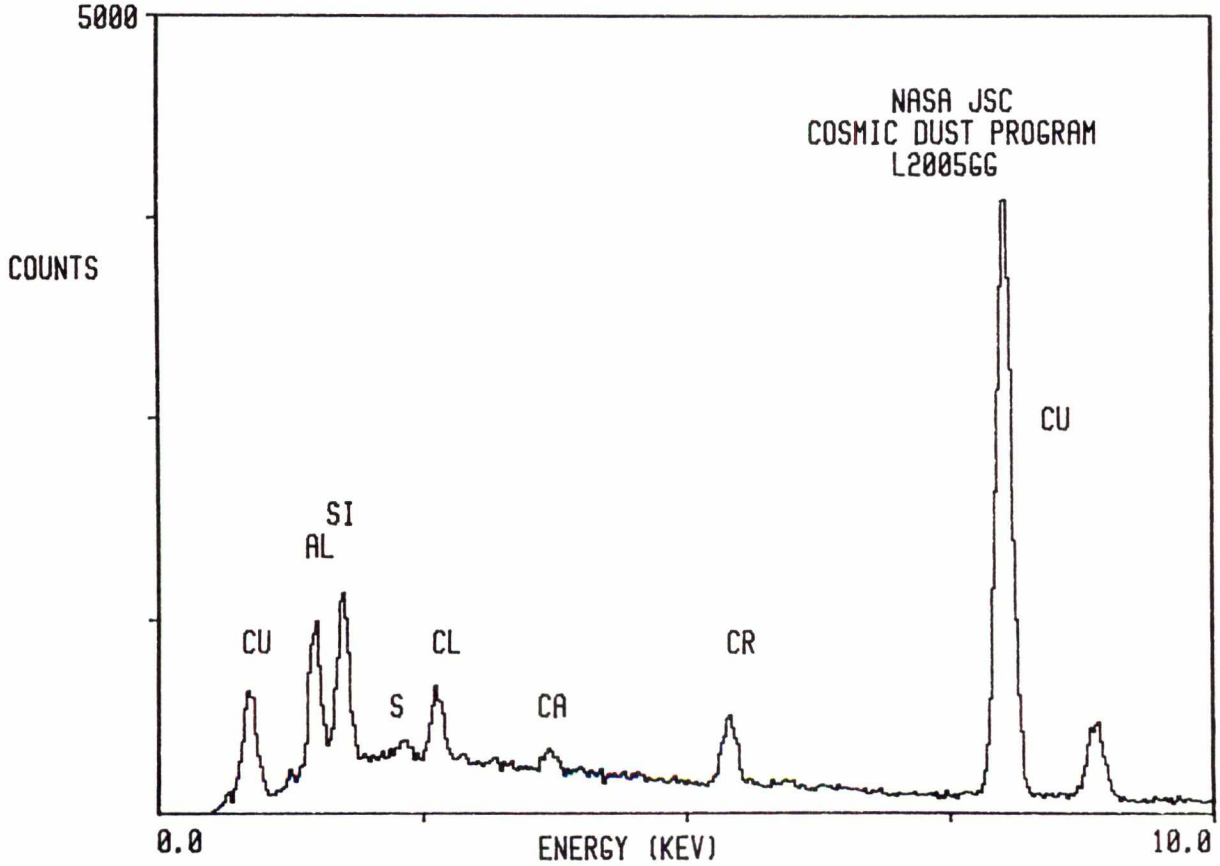
L2005 AG 15



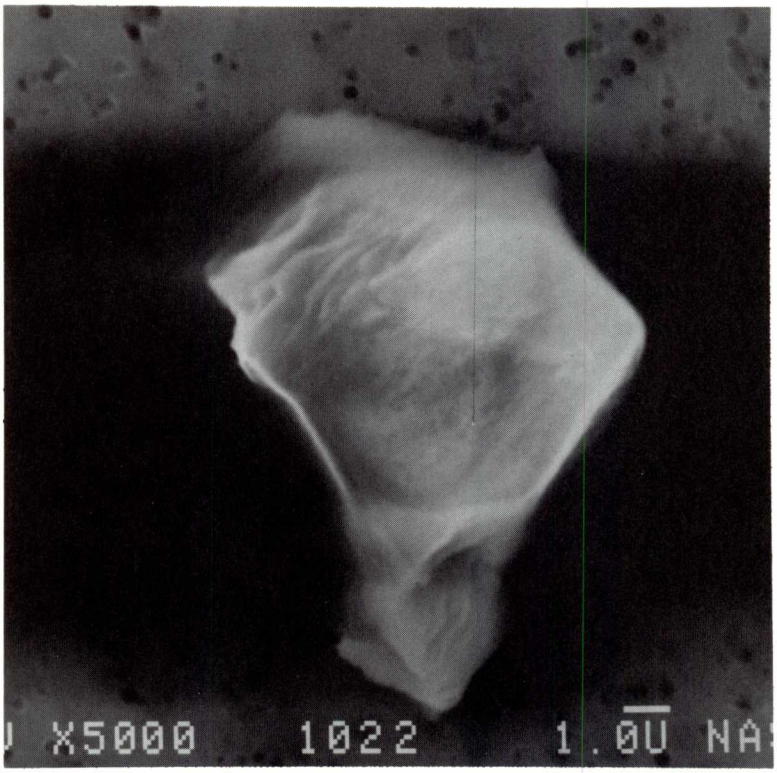
S-92-35377

SIZE: 16x10
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCA

COMMENTS:



L2011 C 3



S-92-35874

SIZE: 17x15

SHAPE: I

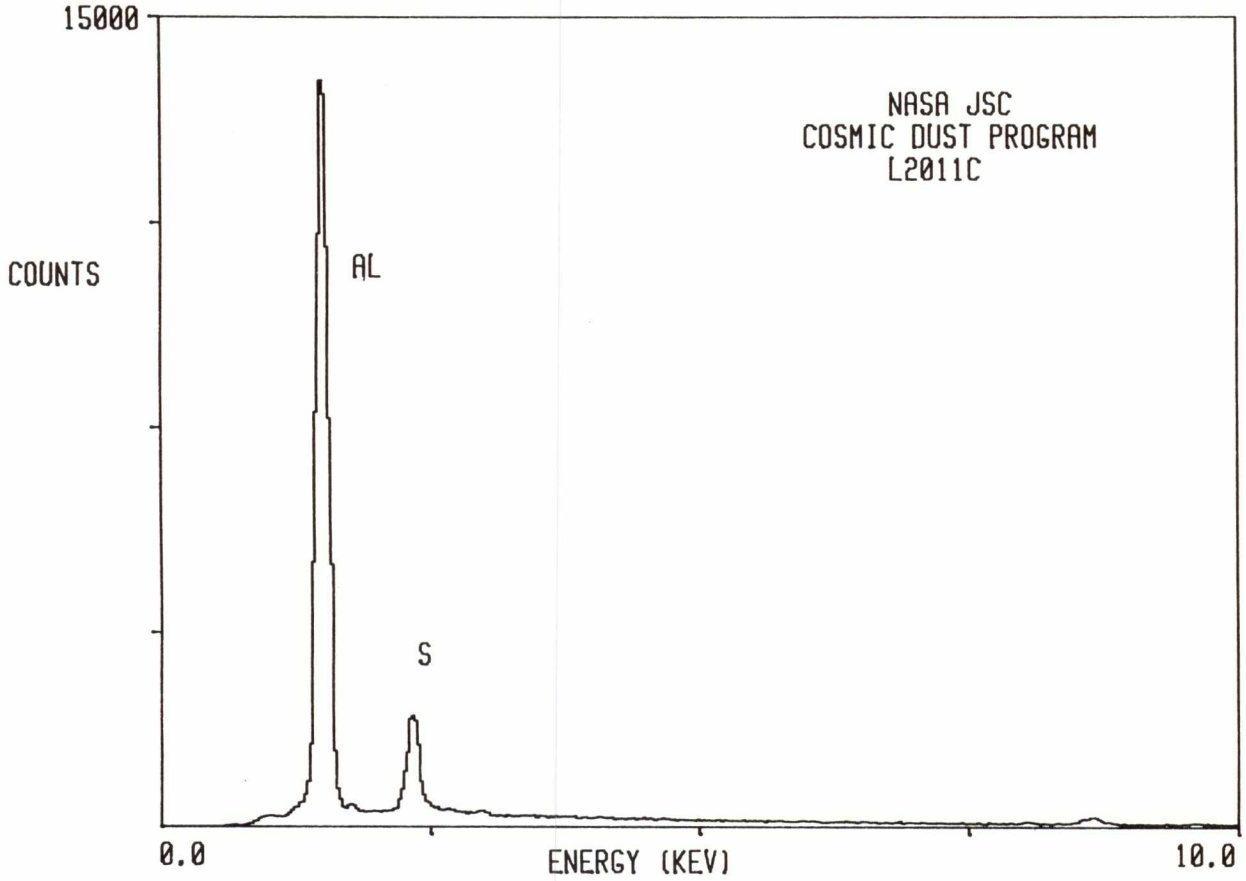
TRANS.: T

COLOR: White to Colorless

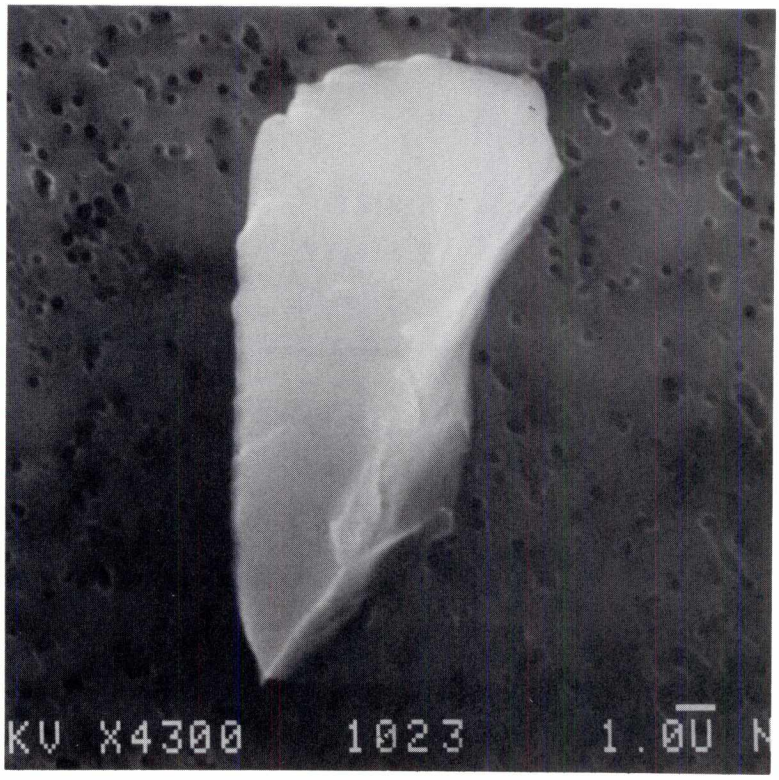
LUSTER: V

TYPE: TCA

COMMENTS:
Cluster 10



L2011 C 4



S-92-35875

SIZE: 15x6

SHAPE: I

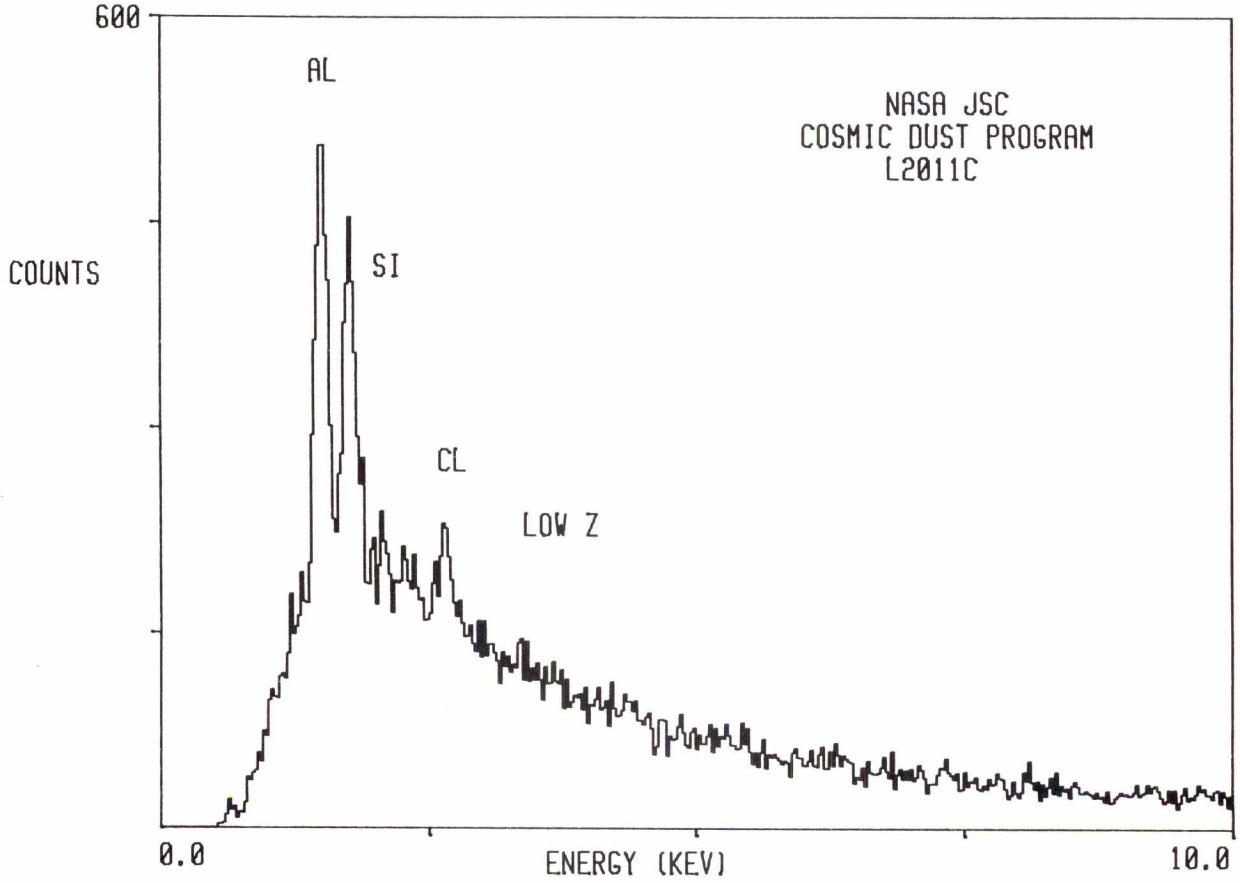
TRANS.: O

COLOR: Black

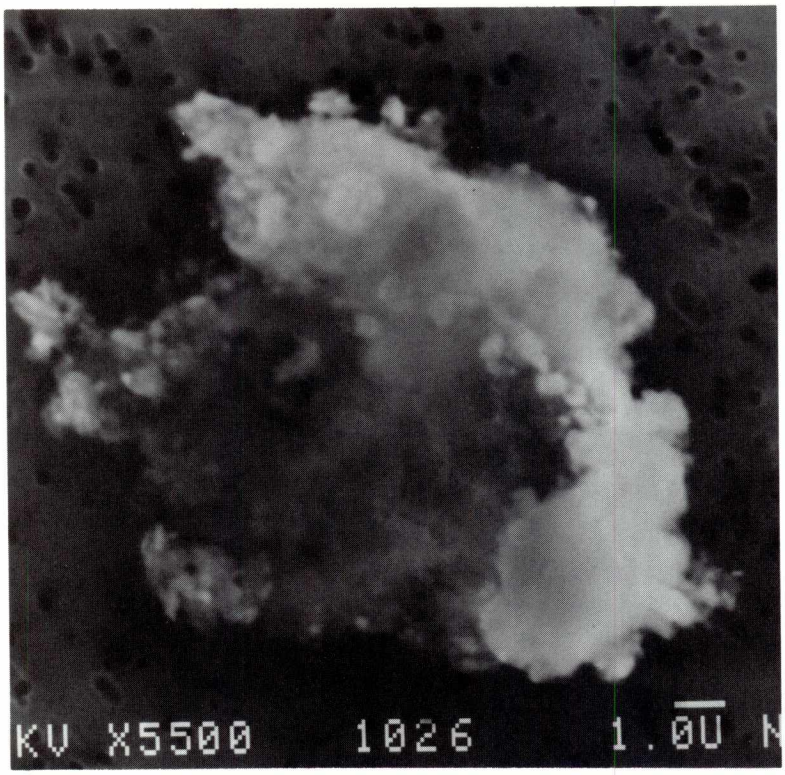
LUSTER: V

TYPE: TCA

COMMENTS:
Cluster 10



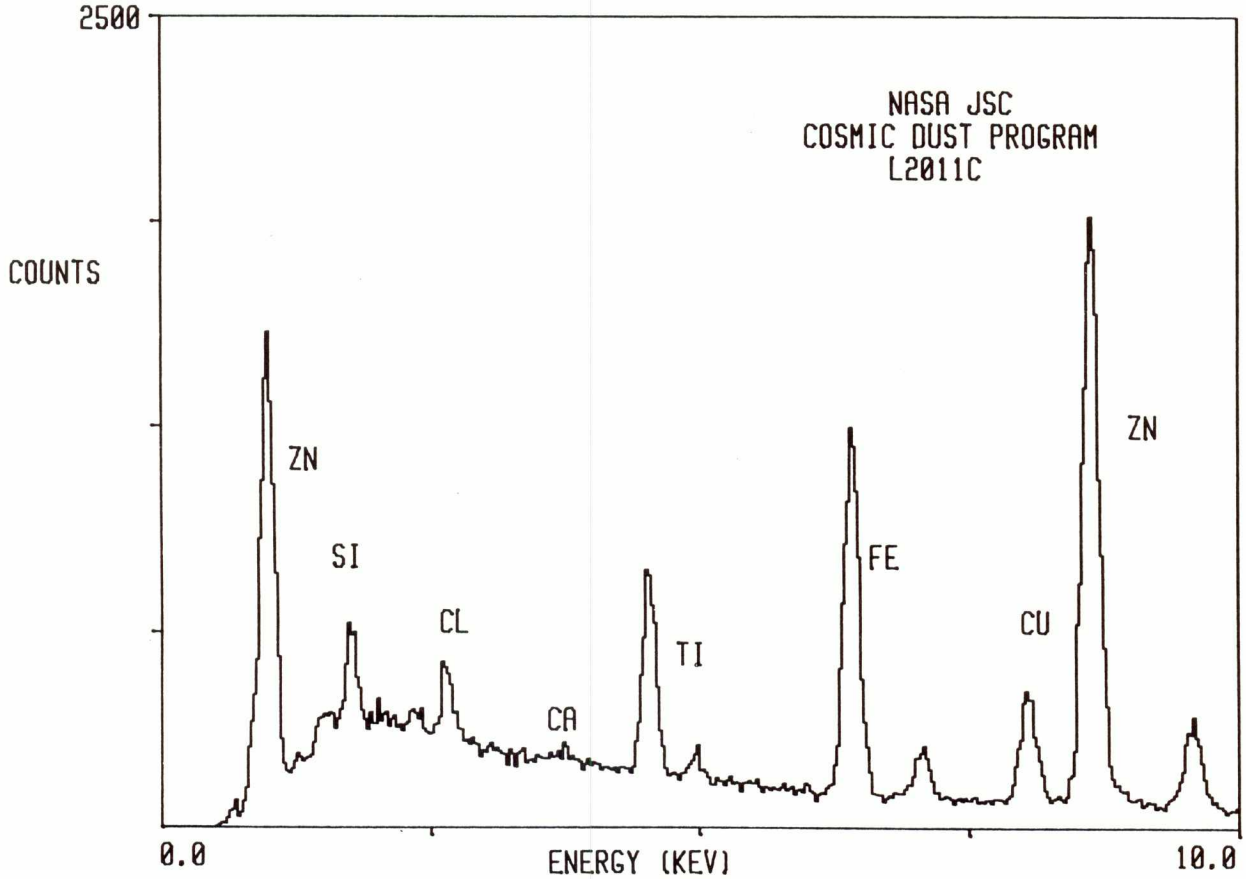
L2011 C 7



S-92-35877

SIZE: 9x8
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCA

COMMENTS:
Cluster 12



L2011 D 3

S-92-35868

SIZE: 6x5

SHAPE: I

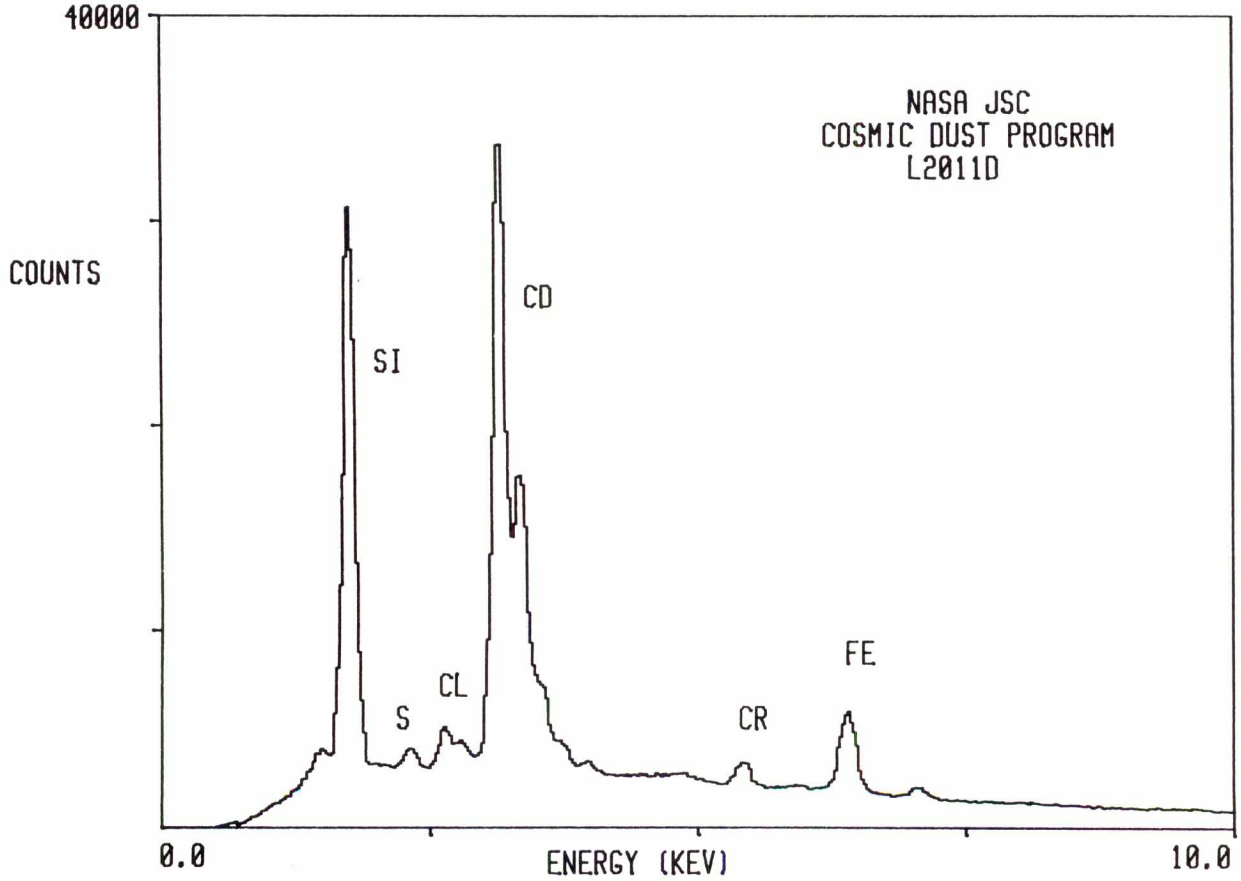
TRANS.: TL

COLOR: Orange

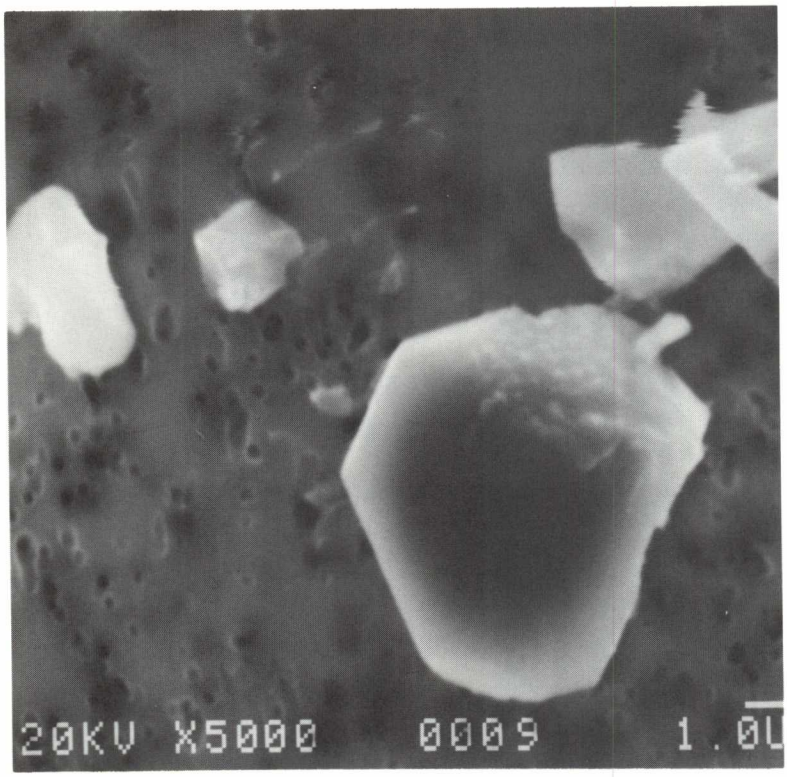
LUSTER: D

TYPE: TCA

COMMENTS:
Cluster 14



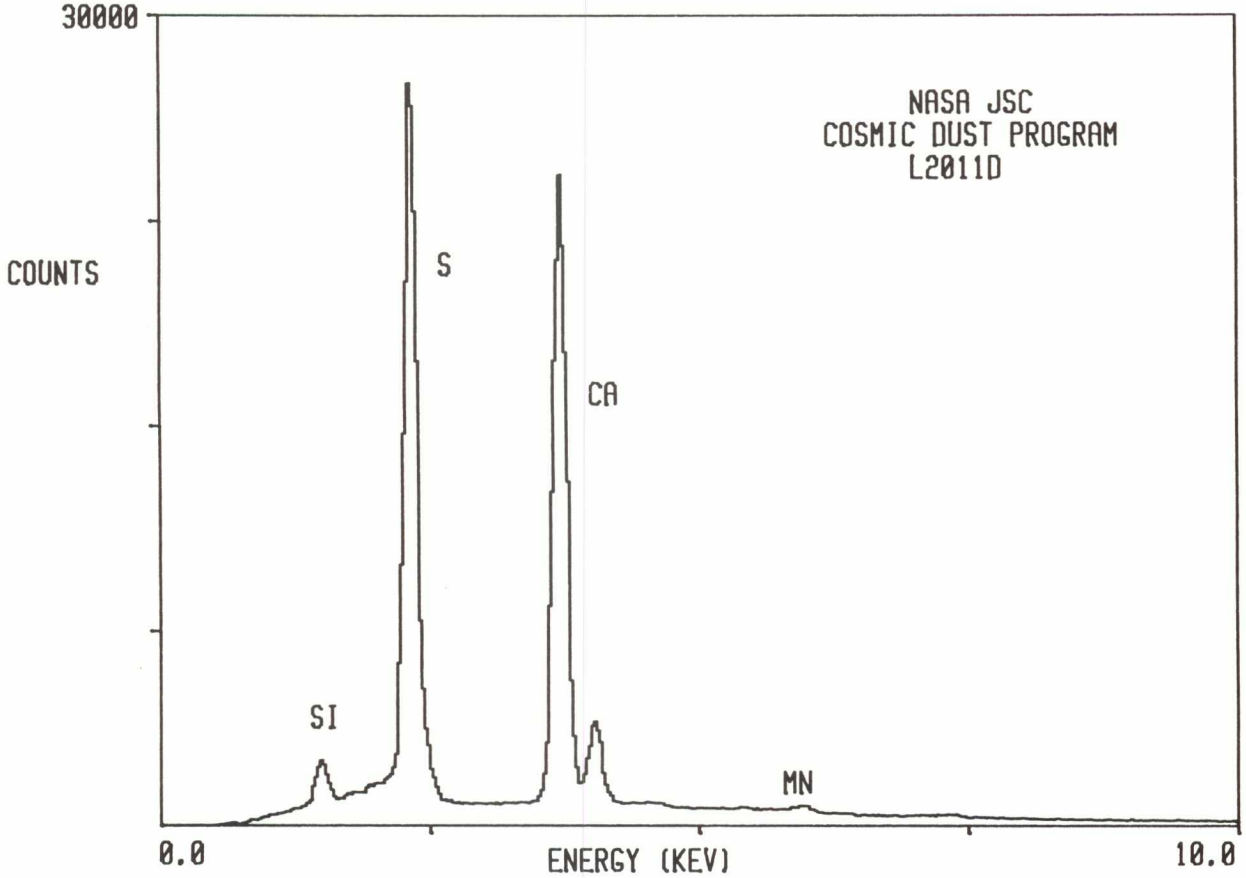
L2011 D 4



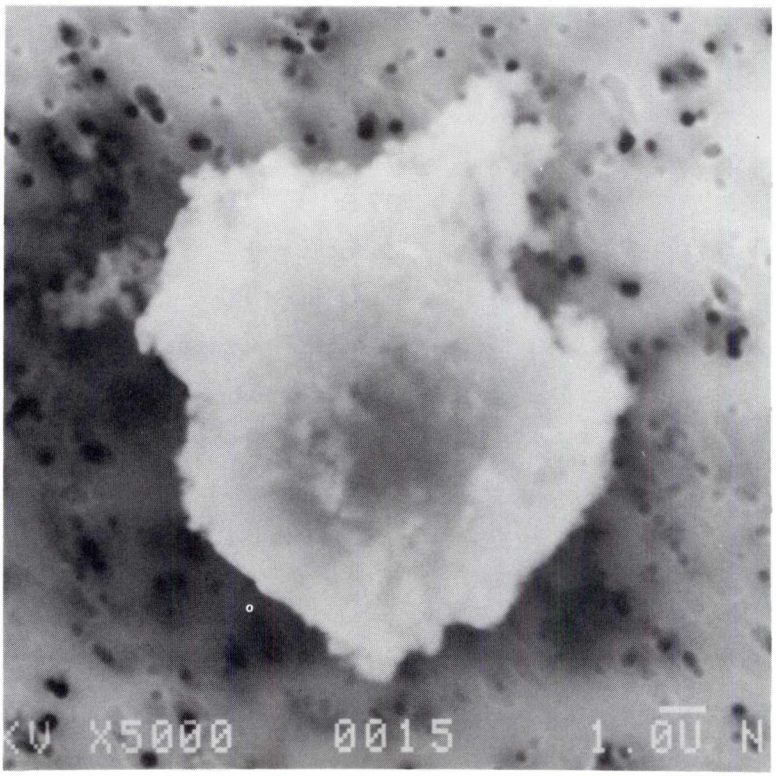
S-92-35869

SIZE: 7x6
SHAPE: E
TRANS.: TL
COLOR: Orange
LUSTER: D
TYPE: TCA

COMMENTS:
Cluster 14



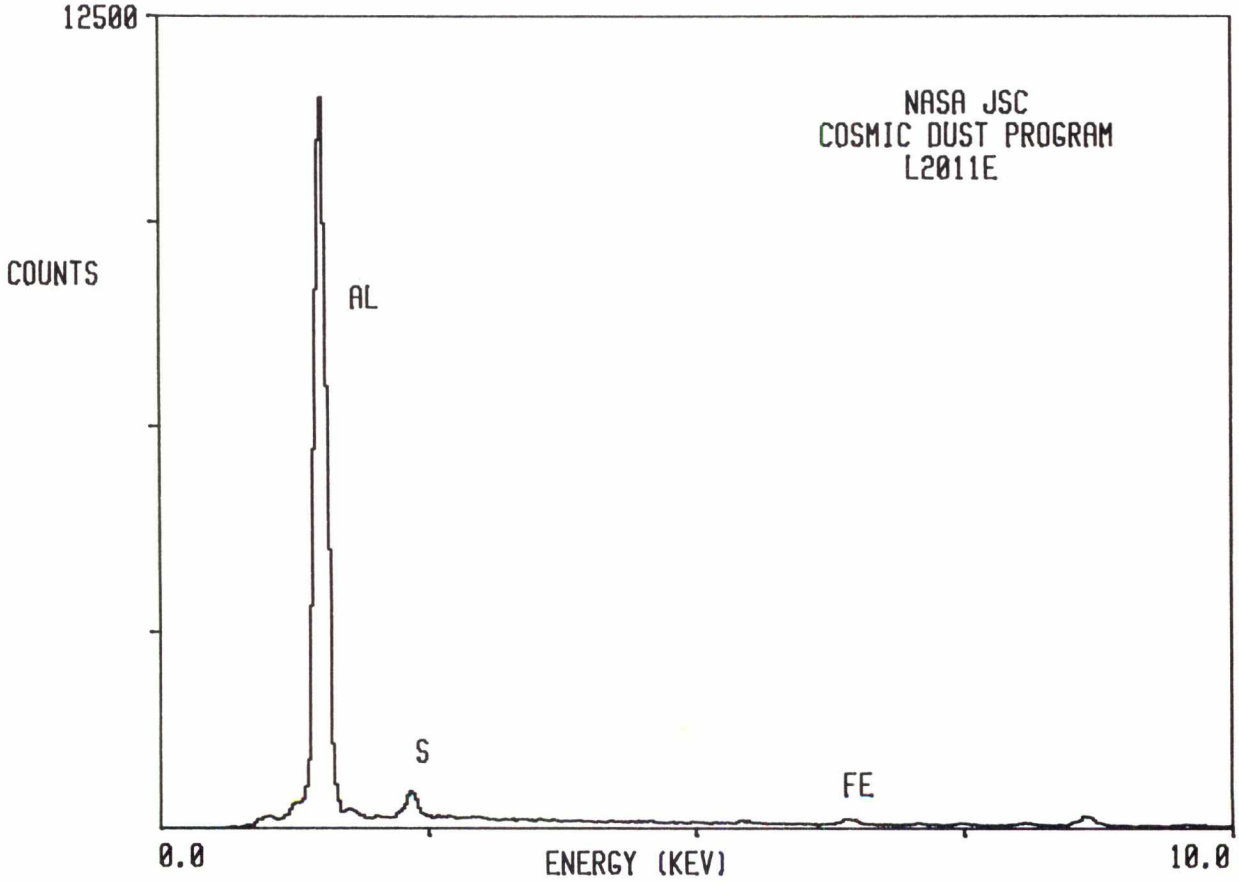
L2011 E 3



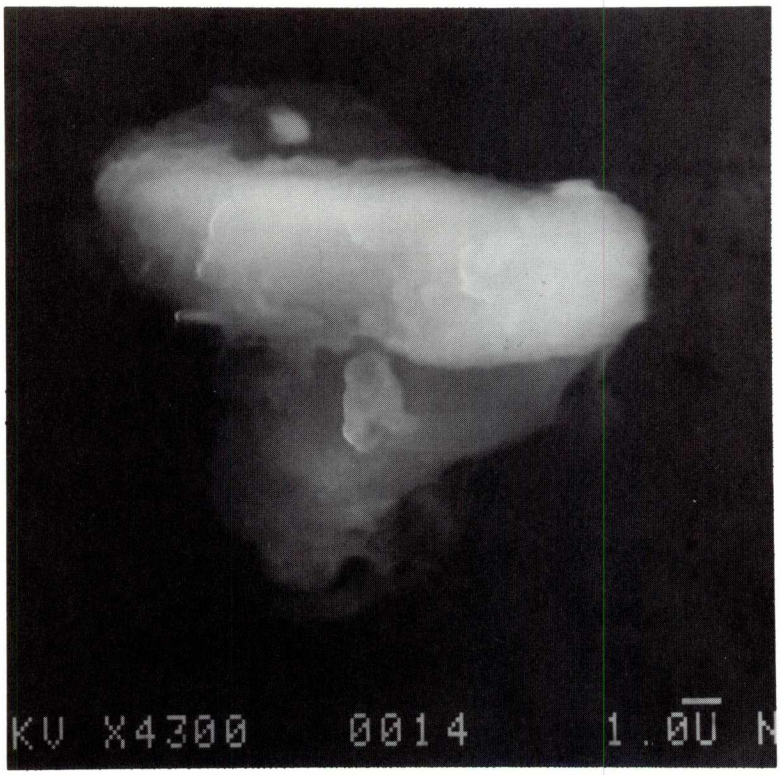
S-92-35861

SIZE: 16x13
SHAPE: E
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA

COMMENTS:
Cluster 18



L2011 E 4



S-92-35862

SIZE: 18x15

SHAPE: E

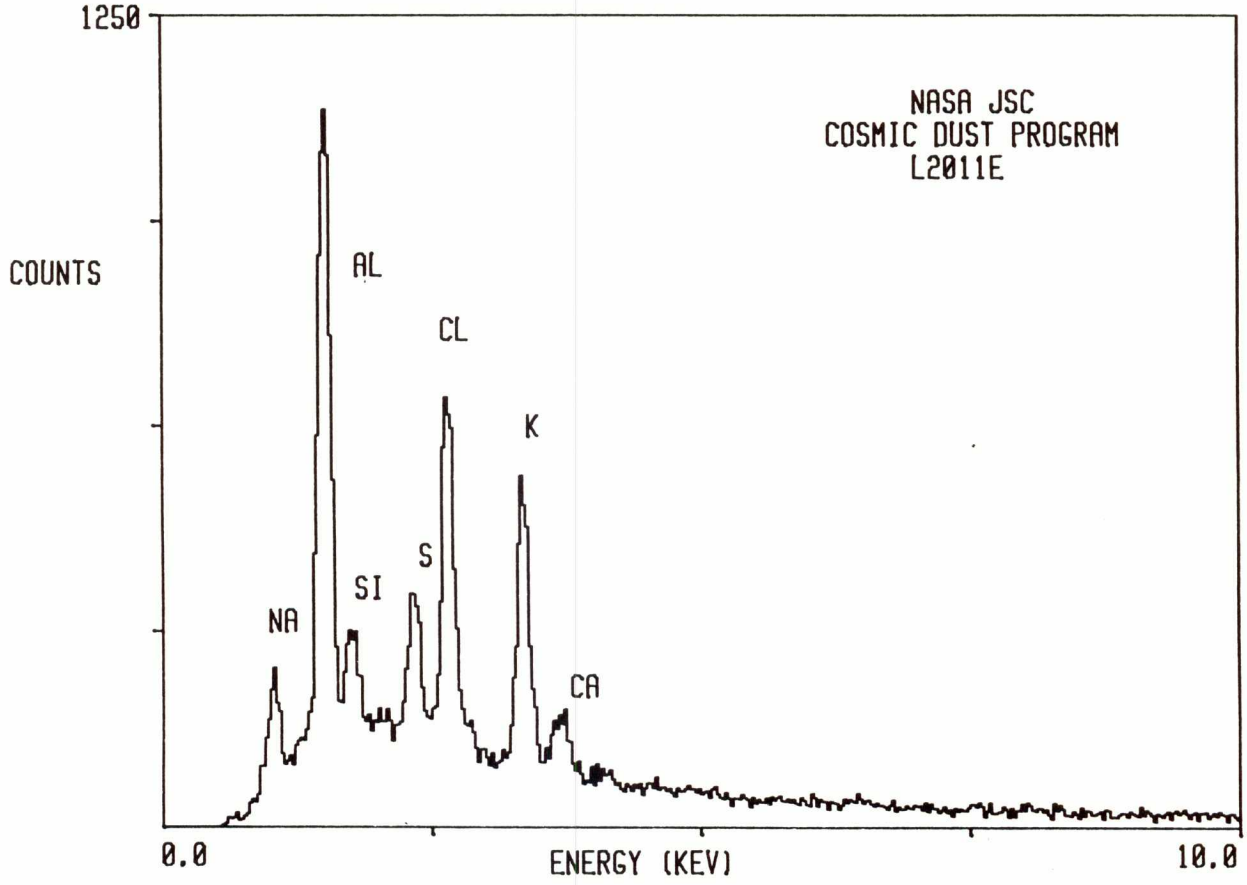
TRANS.: O

COLOR: White to Black

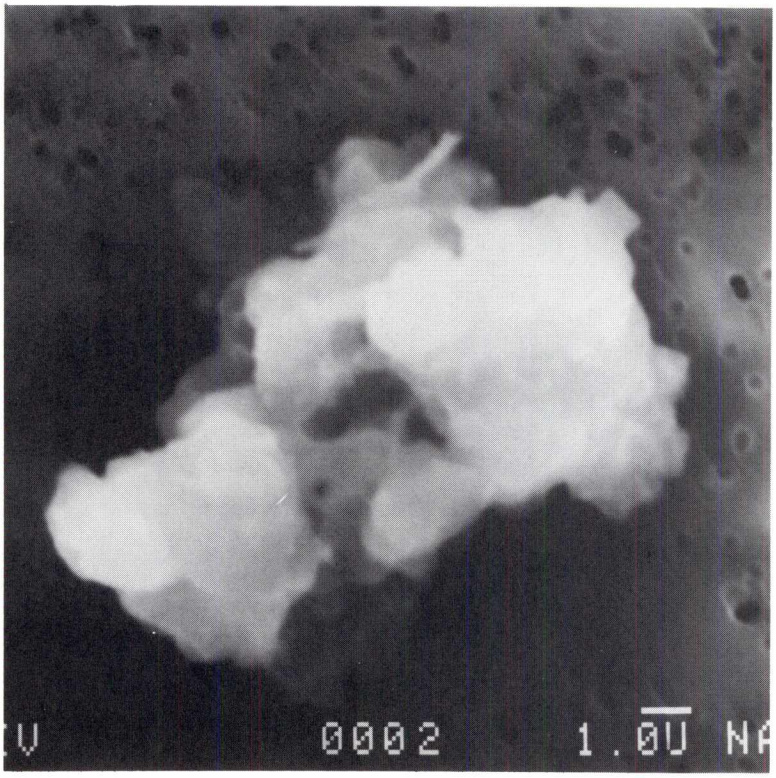
LUSTER: R/M

TYPE: TCA

COMMENTS:
Cluster 18



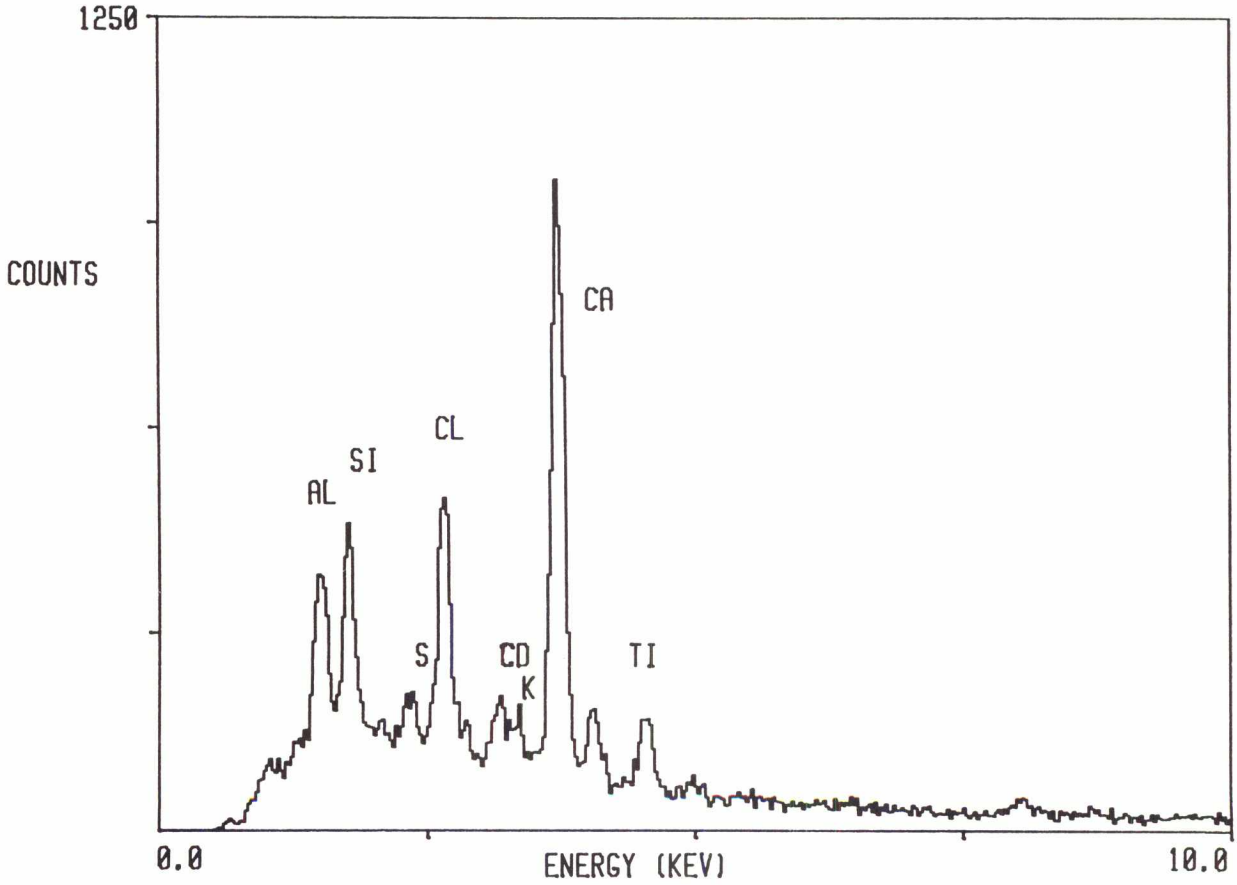
L2011 E 5



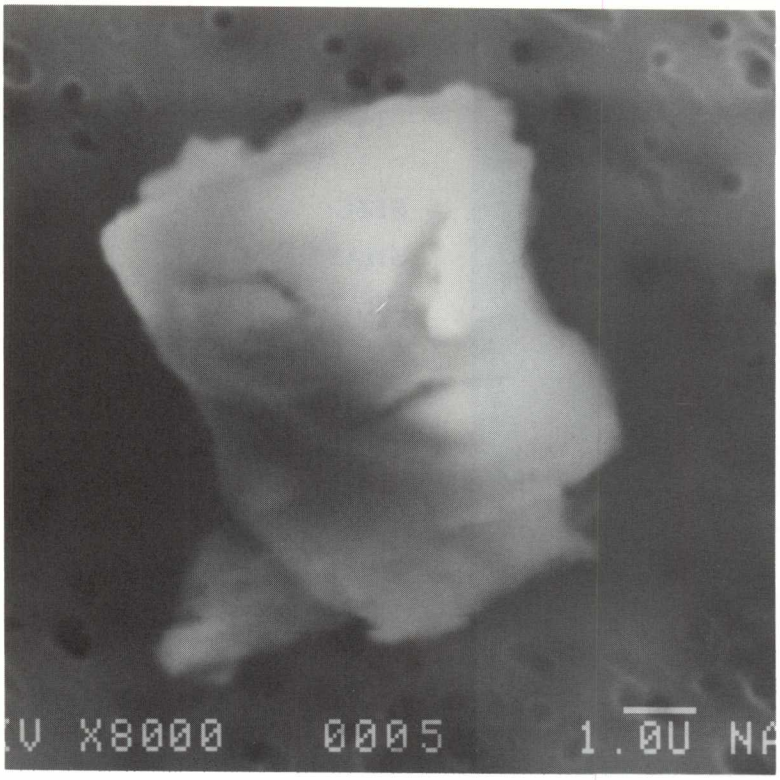
S-92-35863

SIZE: 15x10
SHAPE: E
TRANS.: O
COLOR: White
LUSTER: D
TYPE: TCA

COMMENTS:
Cluster 19



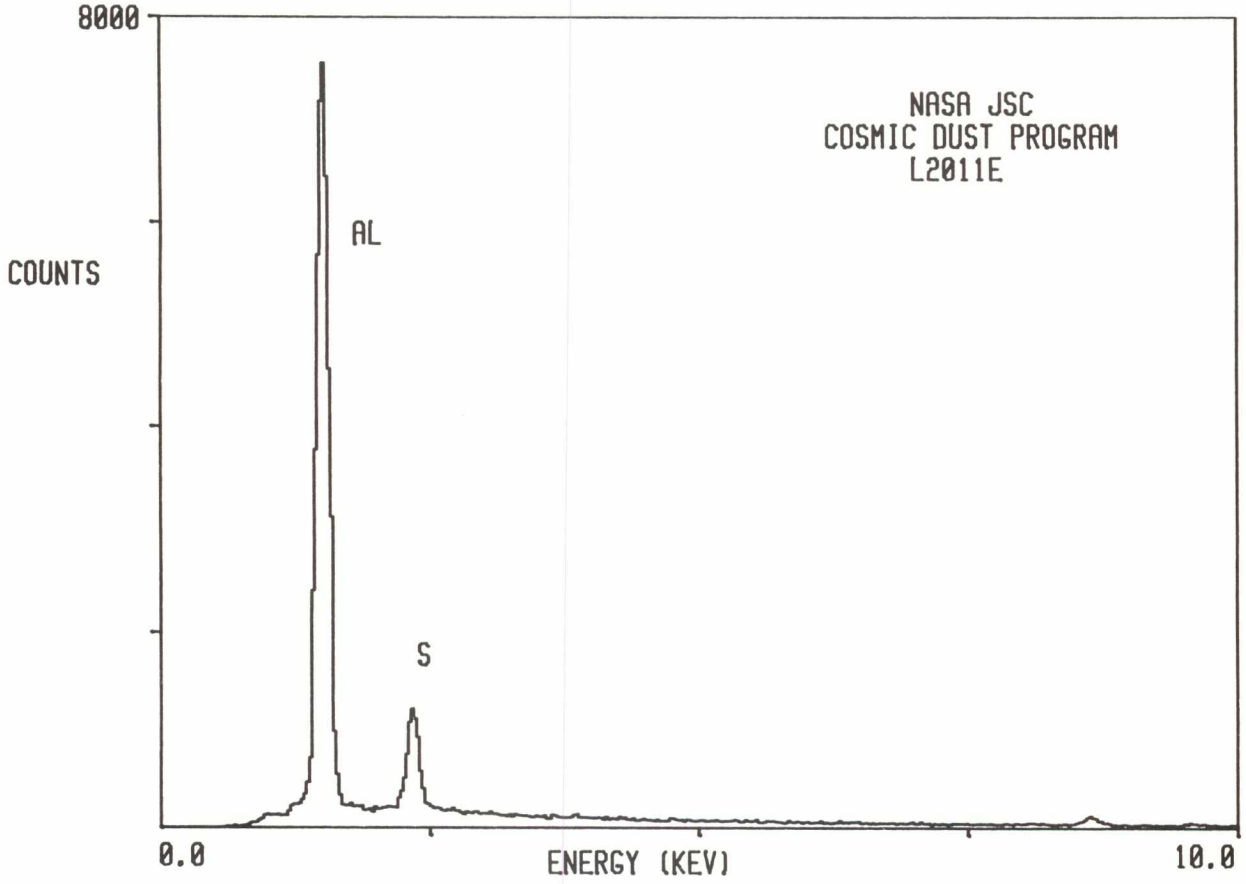
L2011 E 6



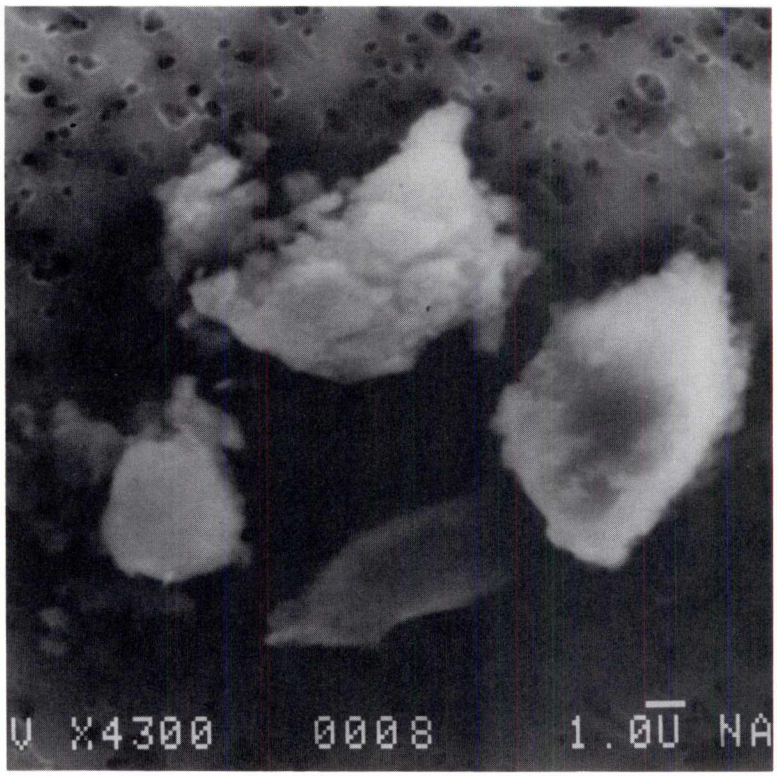
S-92-35864

SIZE: 6
SHAPE: I
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA

COMMENTS:
Cluster 20



L2011 E 7



S-92-35865

SIZE: 7x5

SHAPE: I

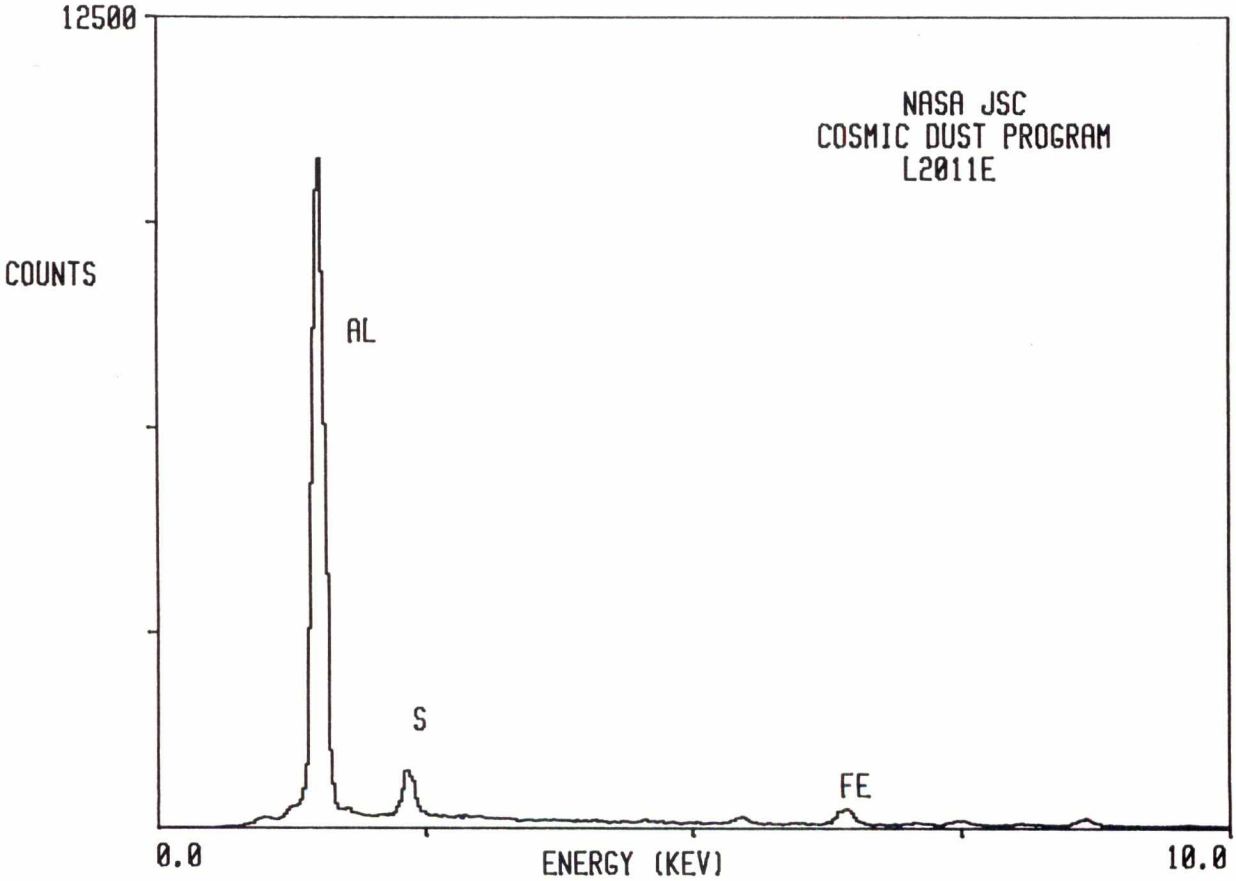
TRANS.: O

COLOR: Silver

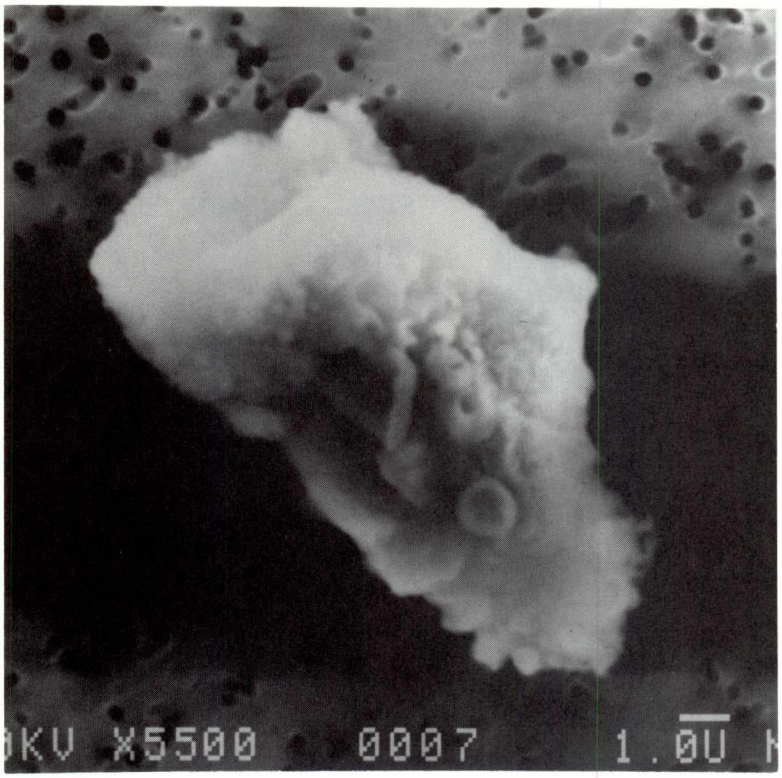
LUSTER: M

TYPE: TCA

COMMENTS:
Cluster 20.
Cluster measures
7x5 microns



L2011 F 3



S-92-35858

SIZE: 13x7

SHAPE: I

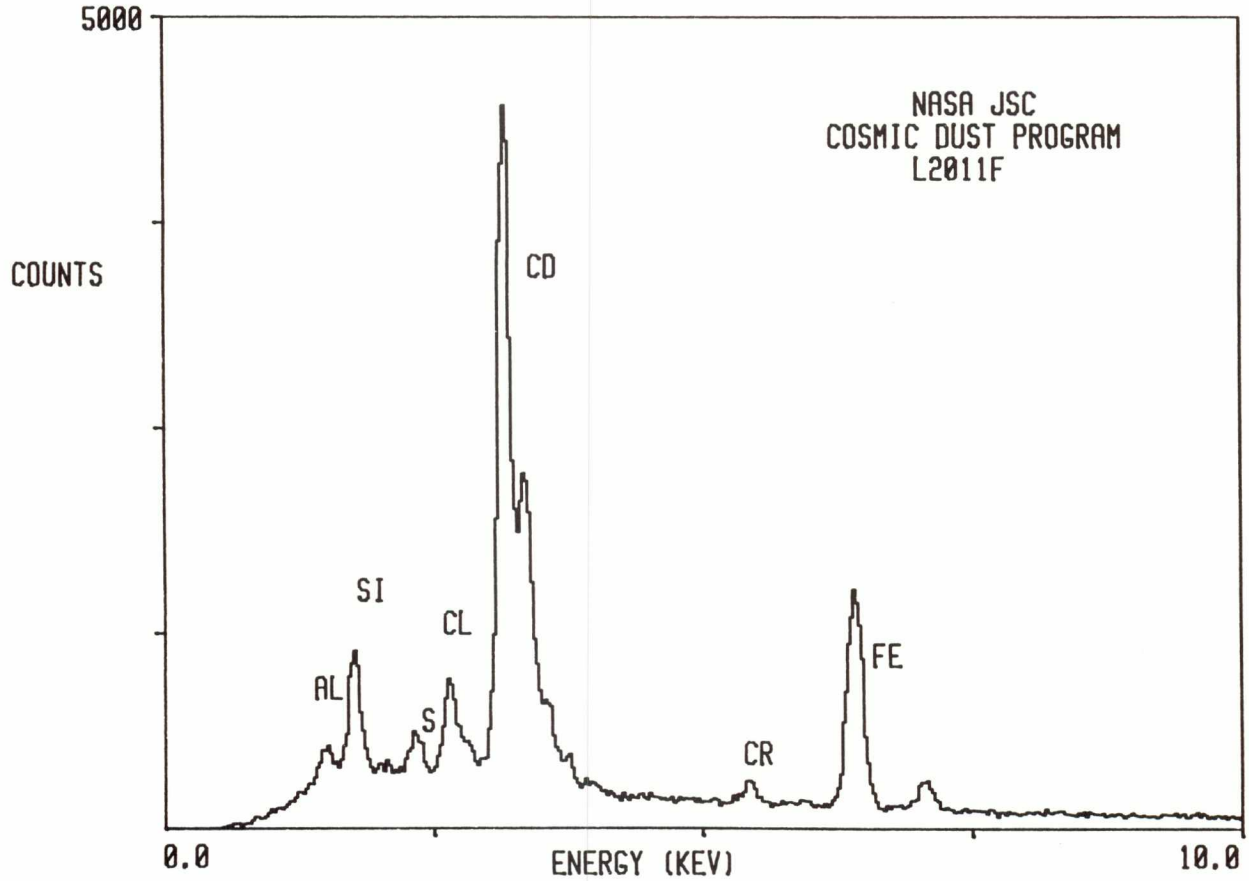
TRANS.: O

COLOR: Colorless to Black

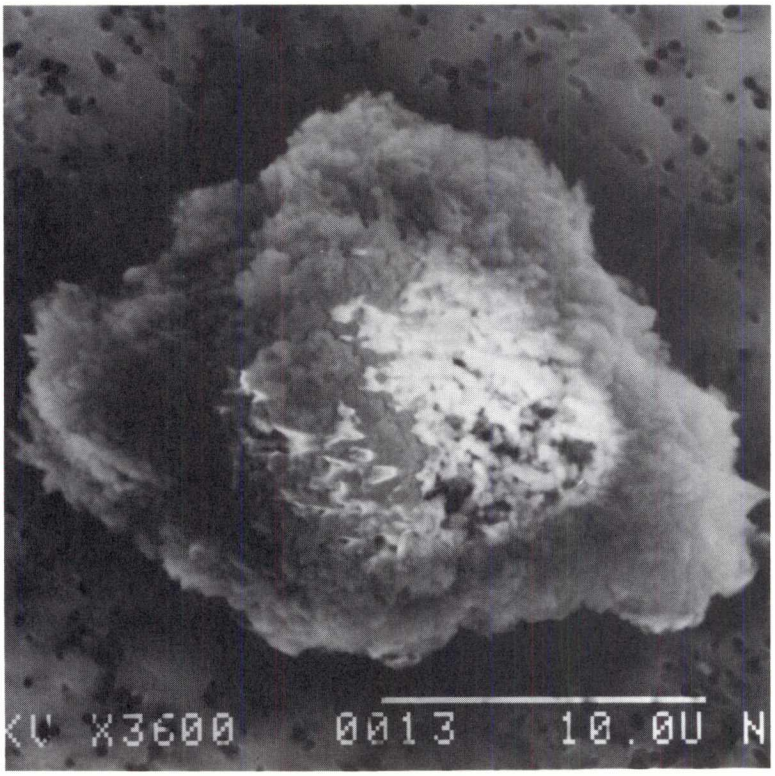
LUSTER: D

TYPE: TCA

COMMENTS:
Cluster 23



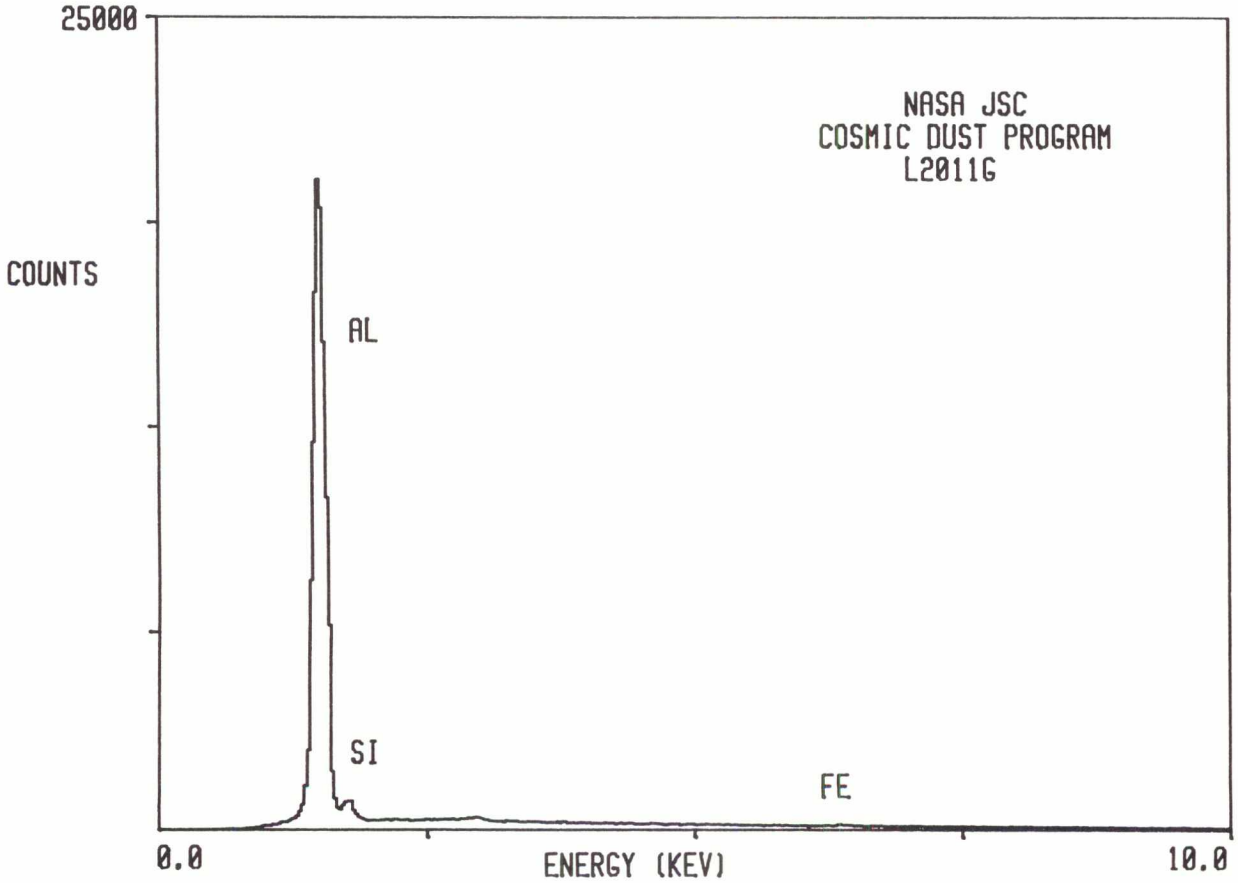
L2011 G 3



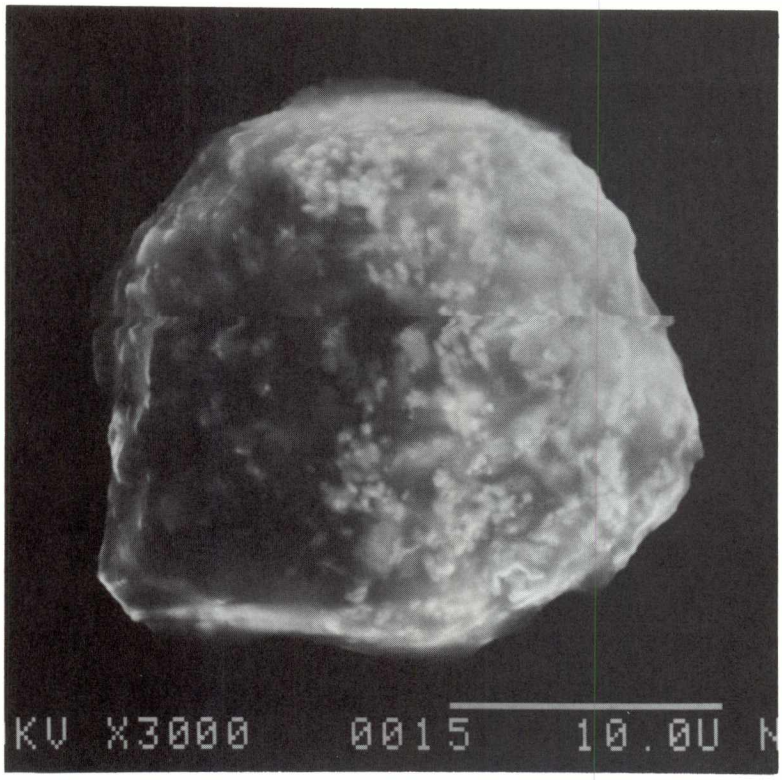
S-92-35846

SIZE: 24x20
SHAPE: E
TRANS.: O
COLOR: White
LUSTER: D
TYPE: TCA

COMMENTS:



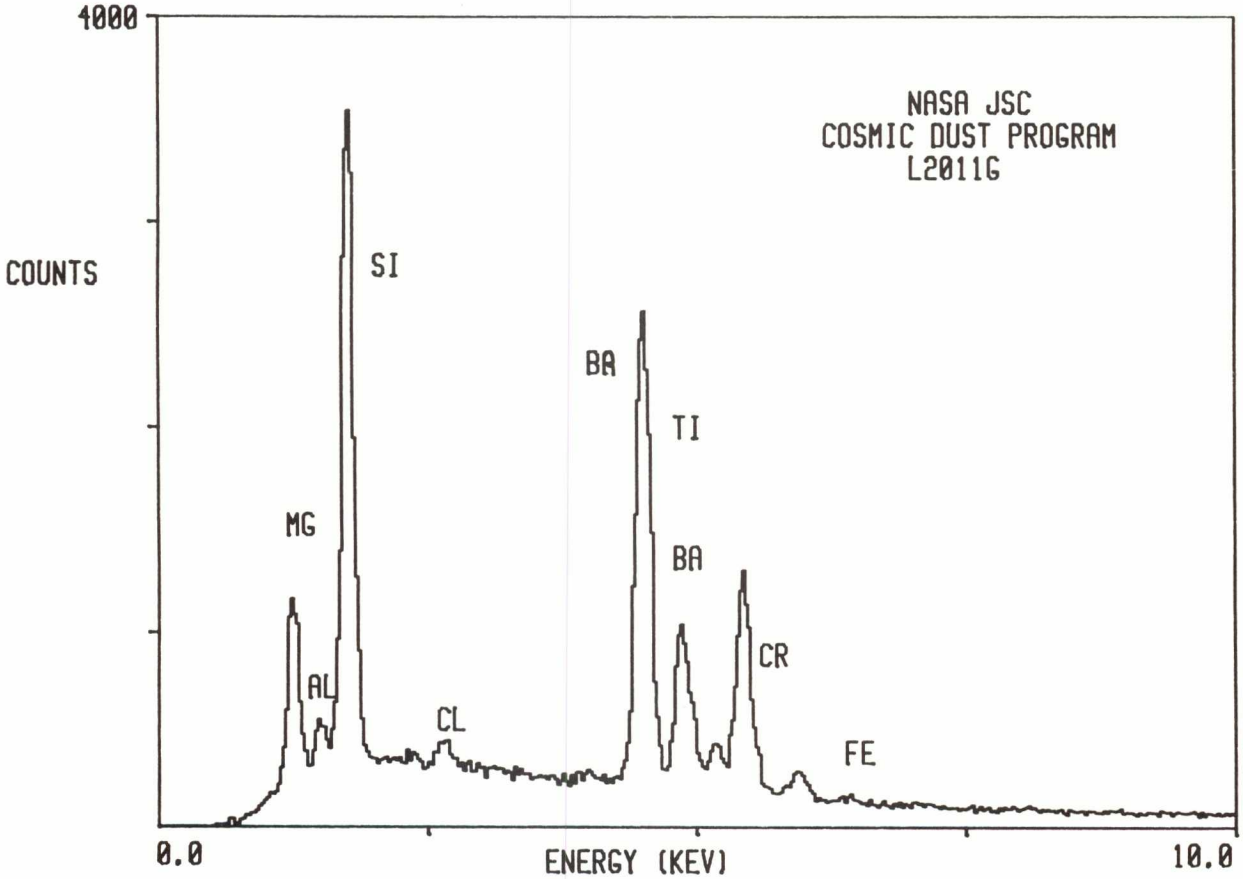
L2011 G 4



S-92-35847

SIZE: 24
SHAPE: S
TRANS.: TL
COLOR: White
LUSTER: D
TYPE: TCA

COMMENTS:

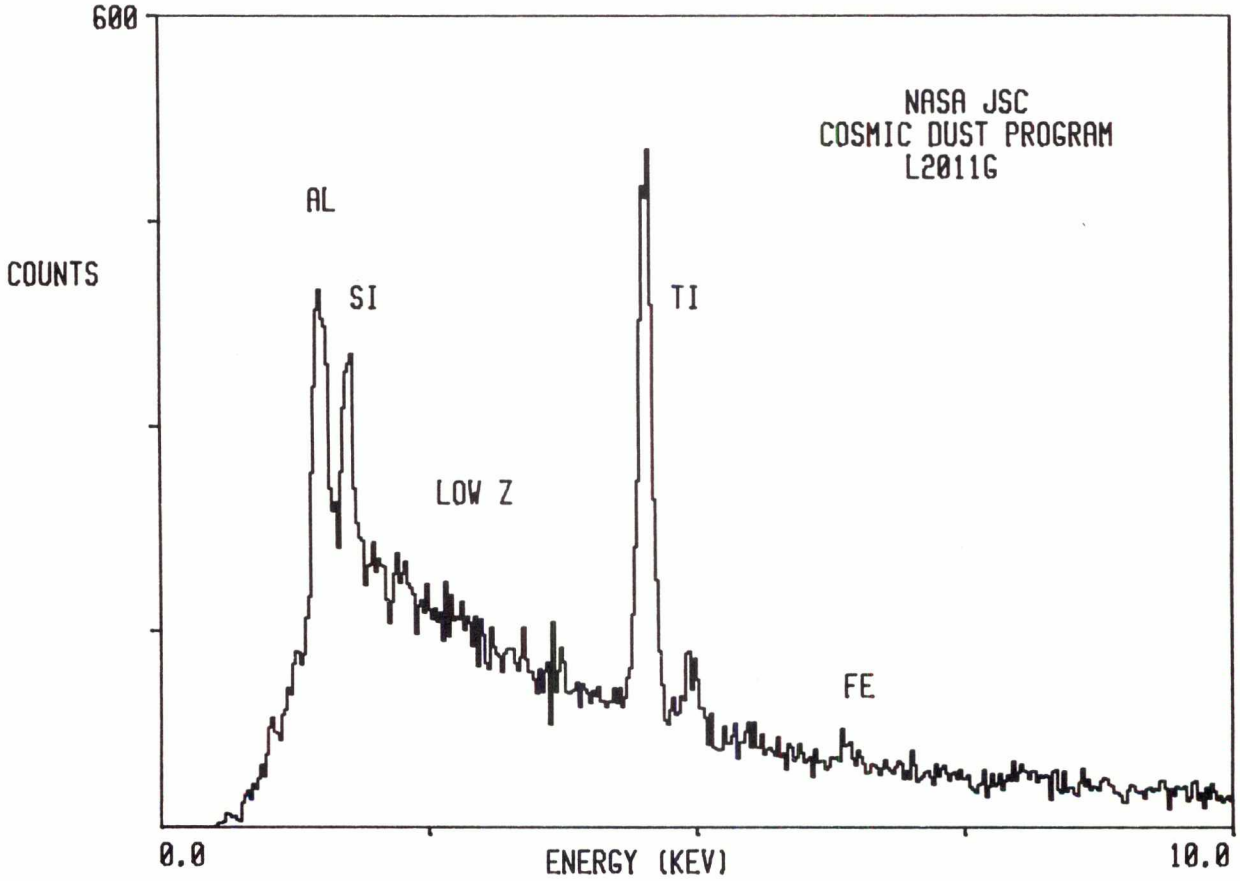


L2011 G 5

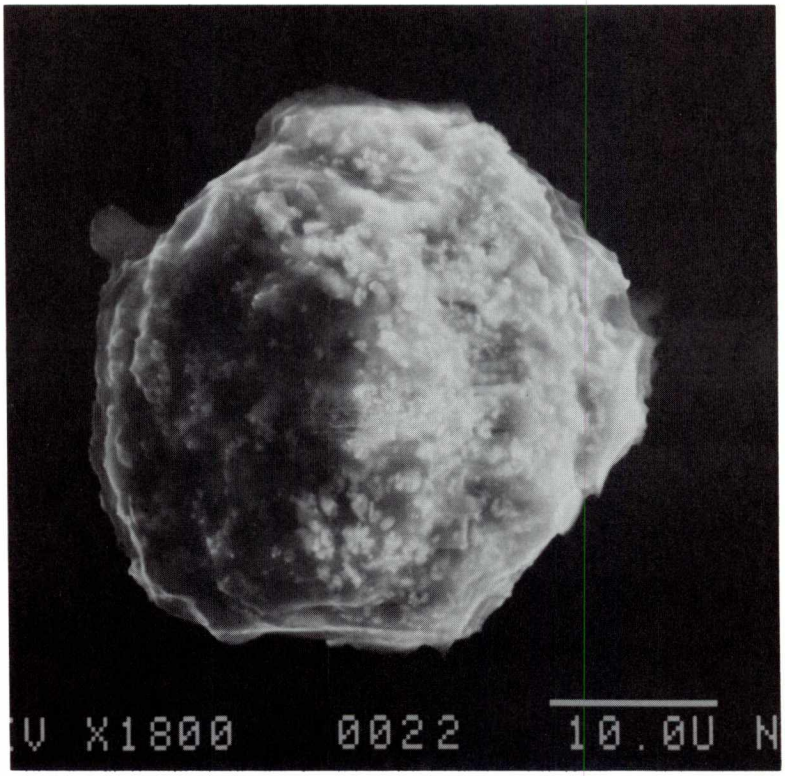
S-92-35848

SIZE: 68x48
SHAPE: E
TRANS.: TL
COLOR: White
LUSTER: D/V
TYPE: TCA

COMMENTS:



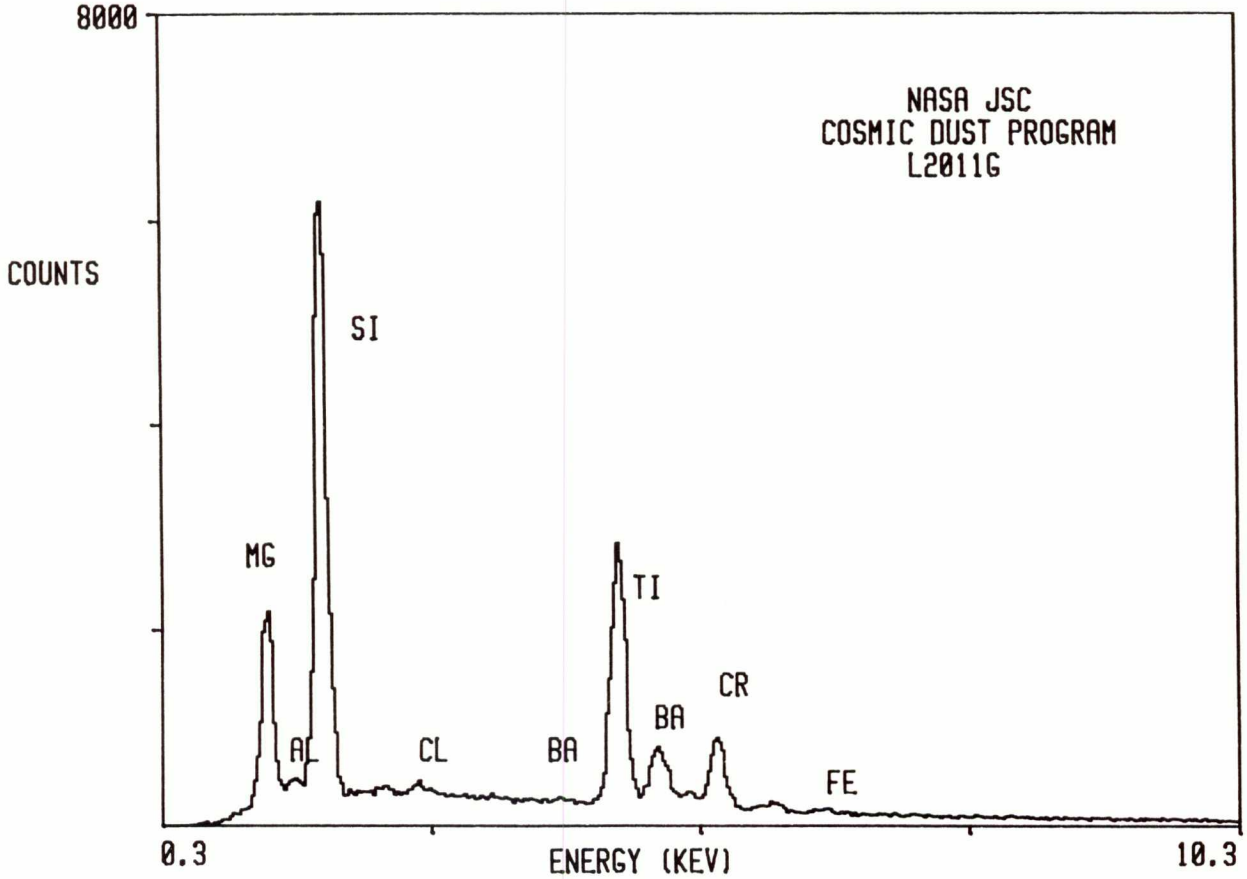
L2011 G 8



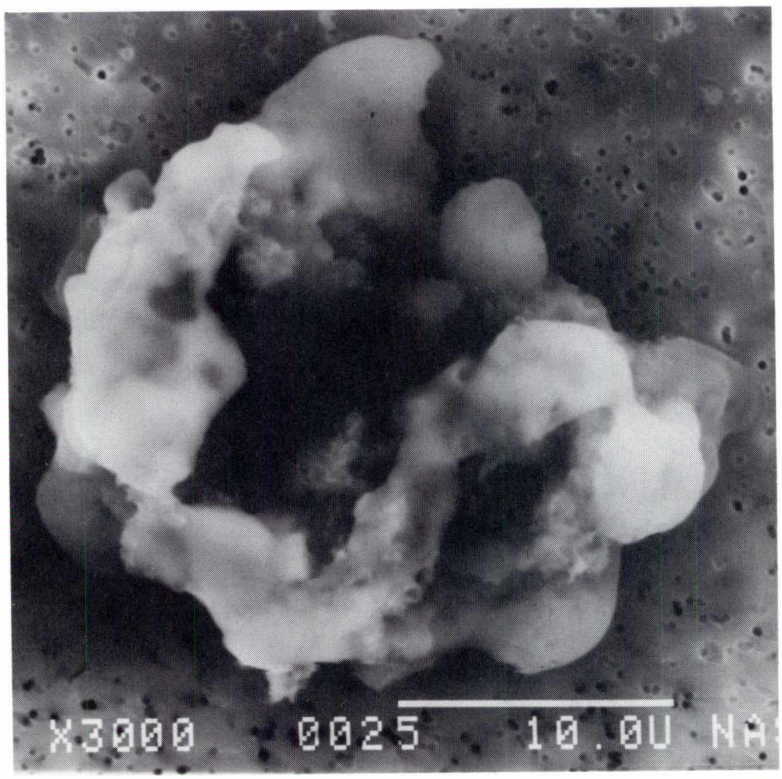
S-92-25851

SIZE: 37
SHAPE: S
TRANS.: TL
COLOR: White
LUSTER: V
TYPE: TCA

COMMENTS:



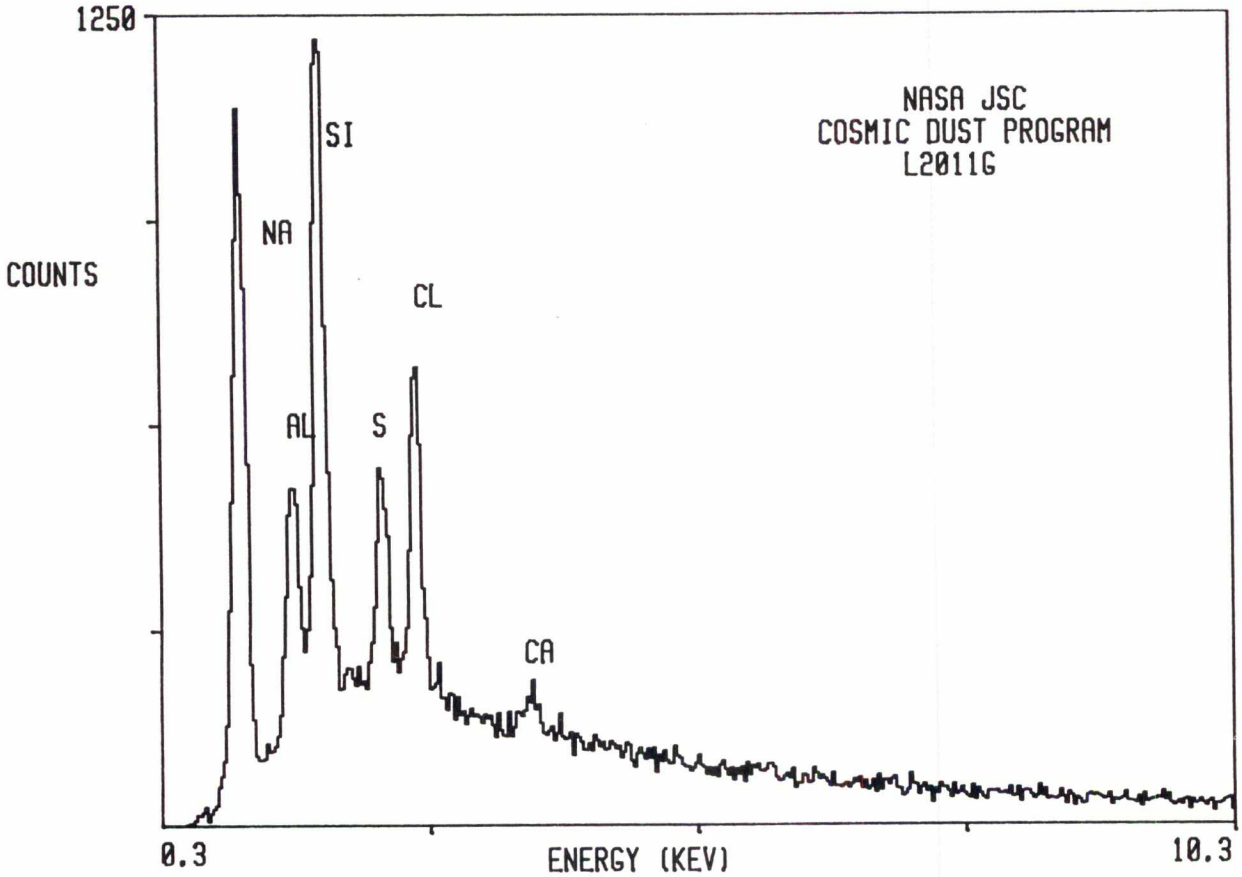
L2011 G 9



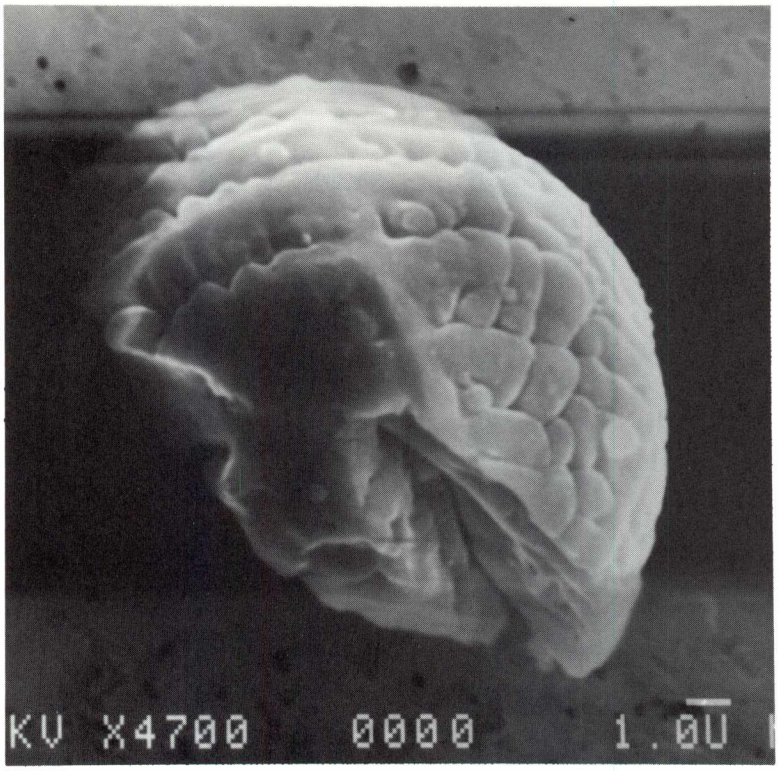
S-92-35852

SIZE: 25x20
SHAPE: E
TRANS.: TL
COLOR: Colorless
LUSTER: V
TYPE: TCA

COMMENTS:



L2011 G 10



S-92-35853

SIZE: 16

SHAPE: S

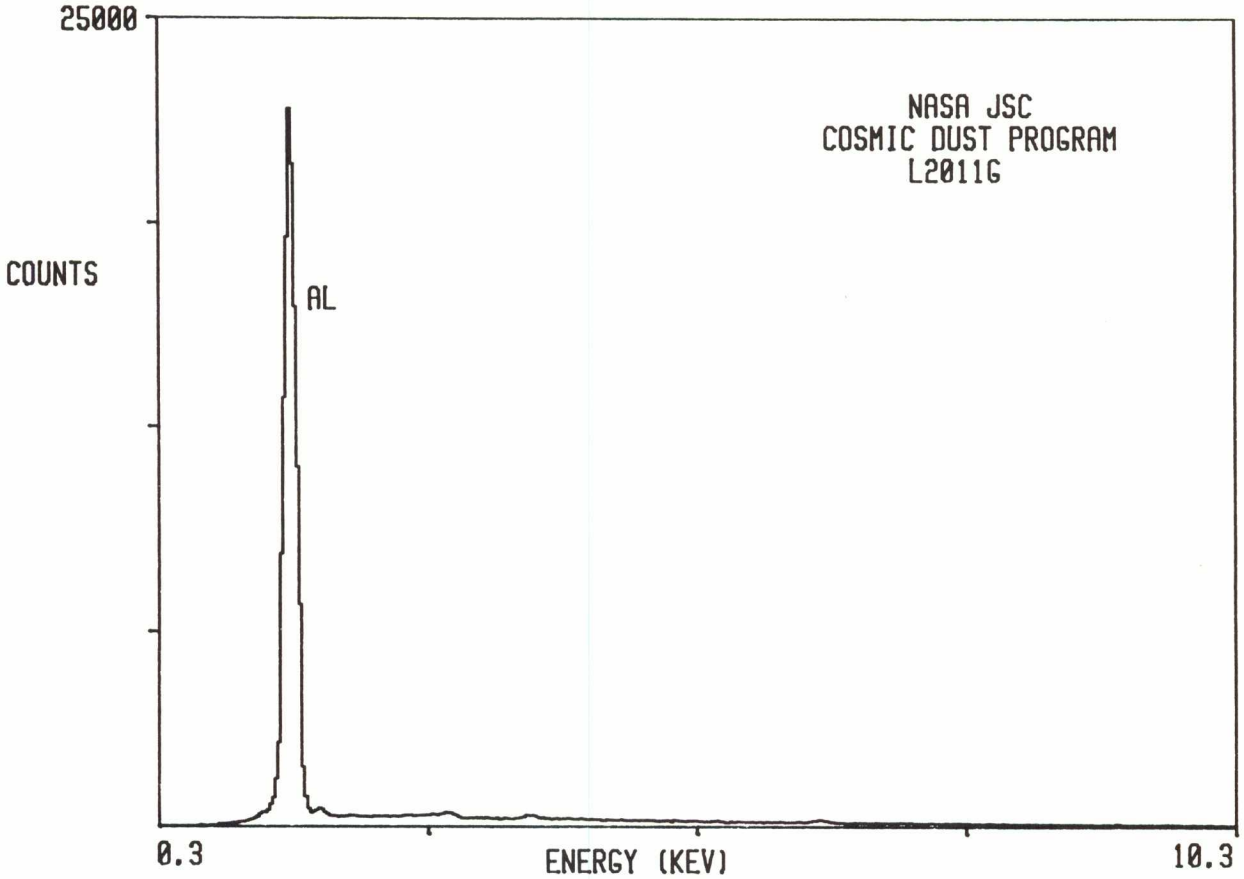
TRANS.: TL

COLOR: White

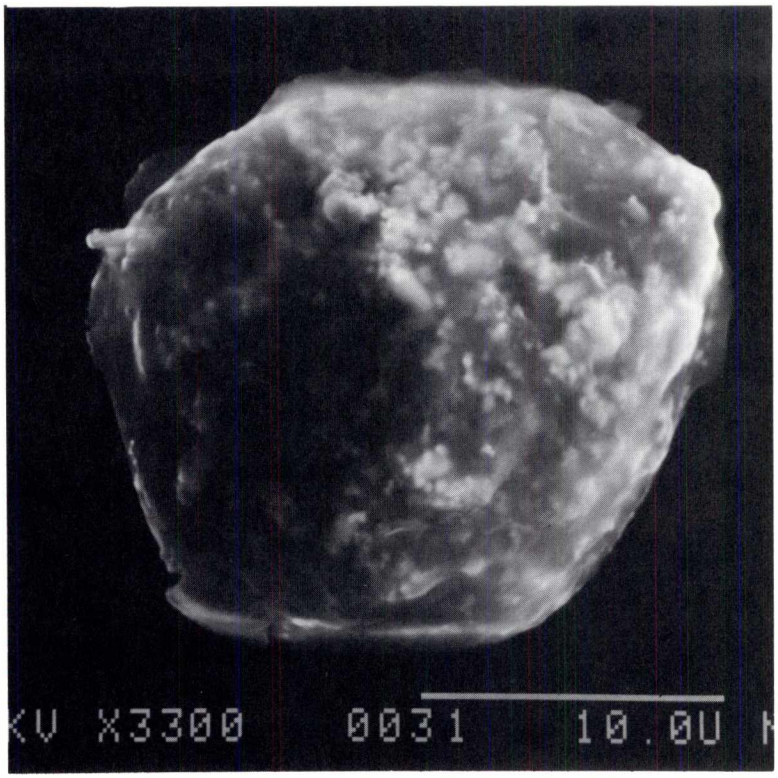
LUSTER: V

TYPE: TCA

COMMENTS:



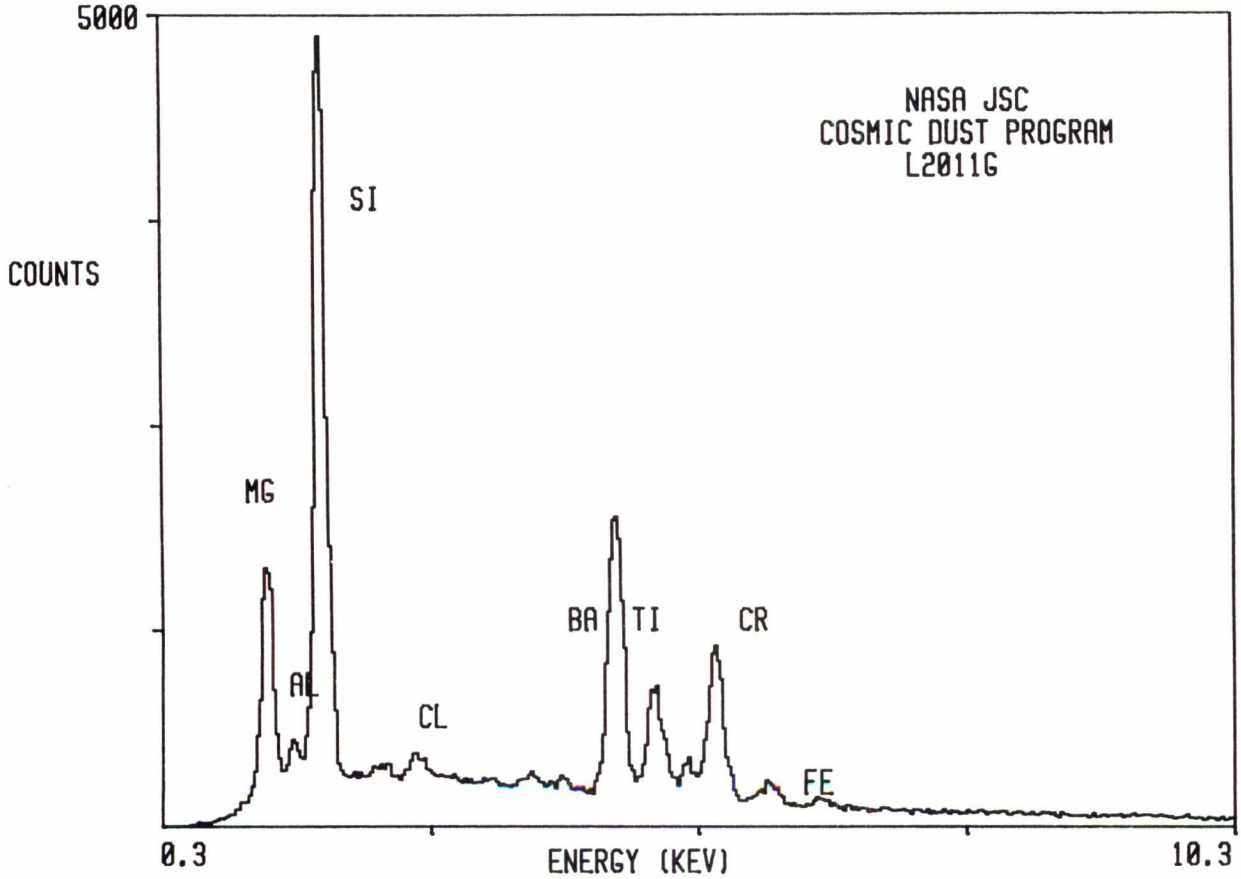
L2011 G 11



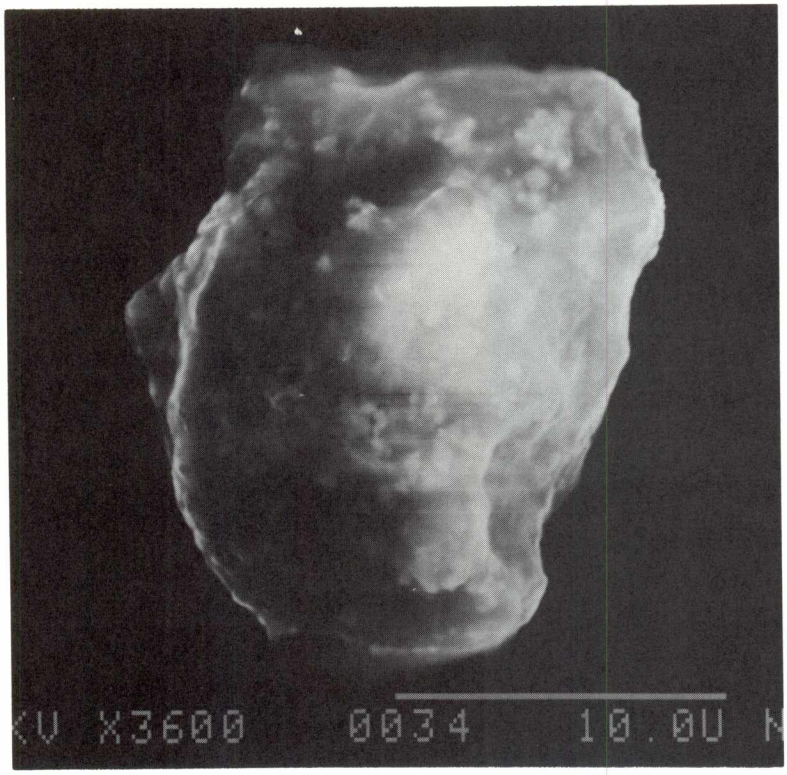
S-92-35854

SIZE: 20
SHAPE: E/S
TRANS.: TL
COLOR: White
LUSTER: V
TYPE: TCA

COMMENTS:



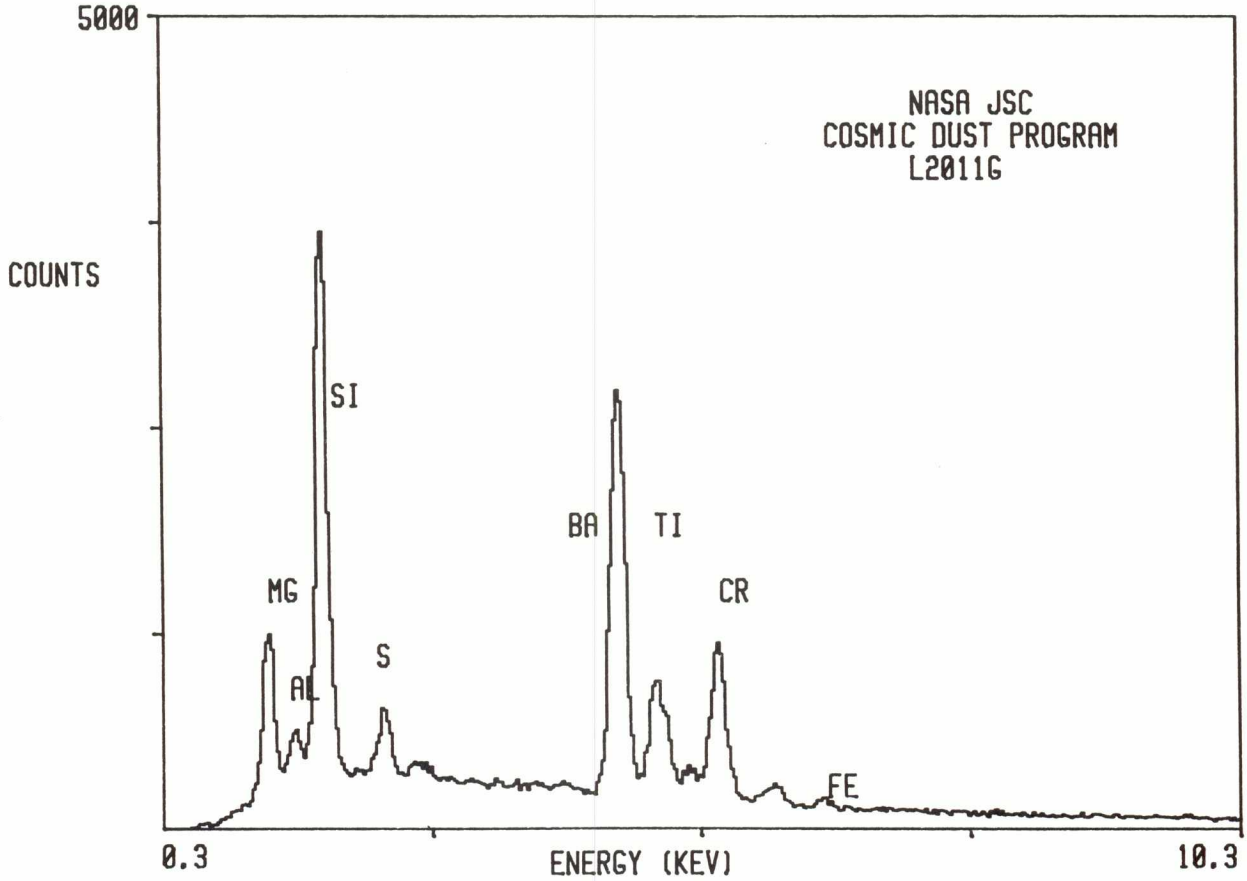
L2011 G 12



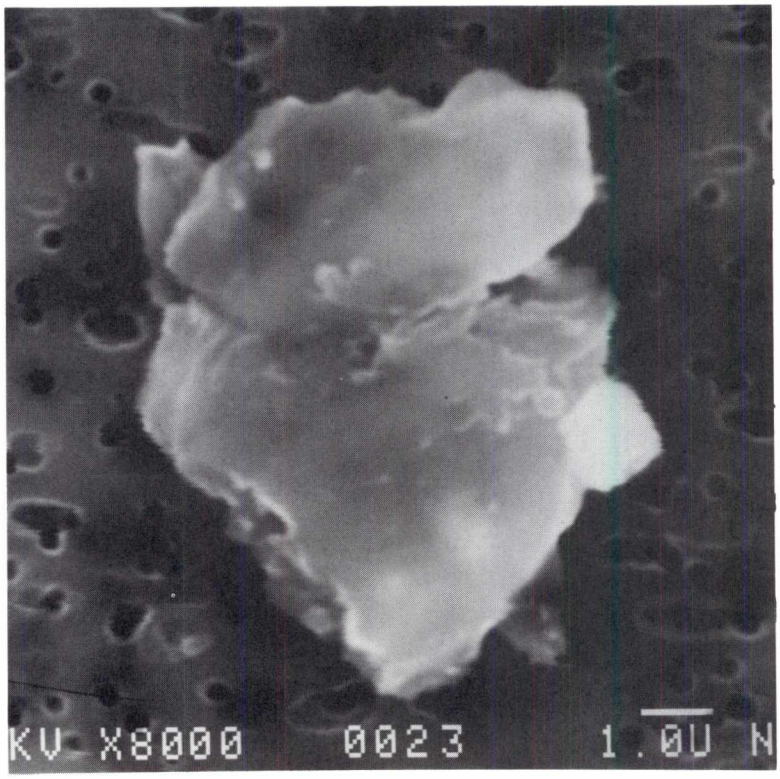
S-92-35855

SIZE: 20
SHAPE: E/S
TRANS.: TL
COLOR: White
LUSTER: V
TYPE: TCA

COMMENTS:



L2011 H 1



S-92-35832

SIZE: 8

SHAPE: I

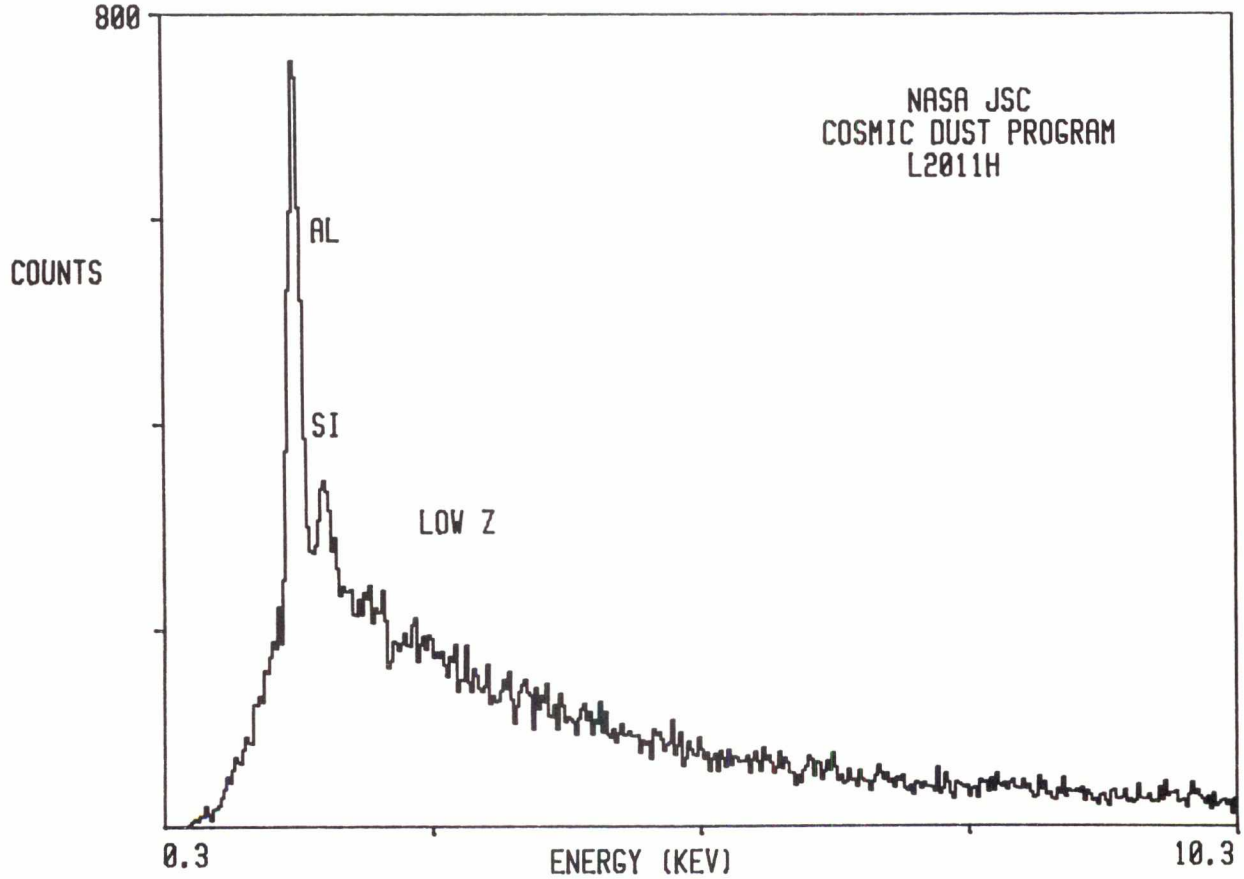
TRANS.: O

COLOR: Silver

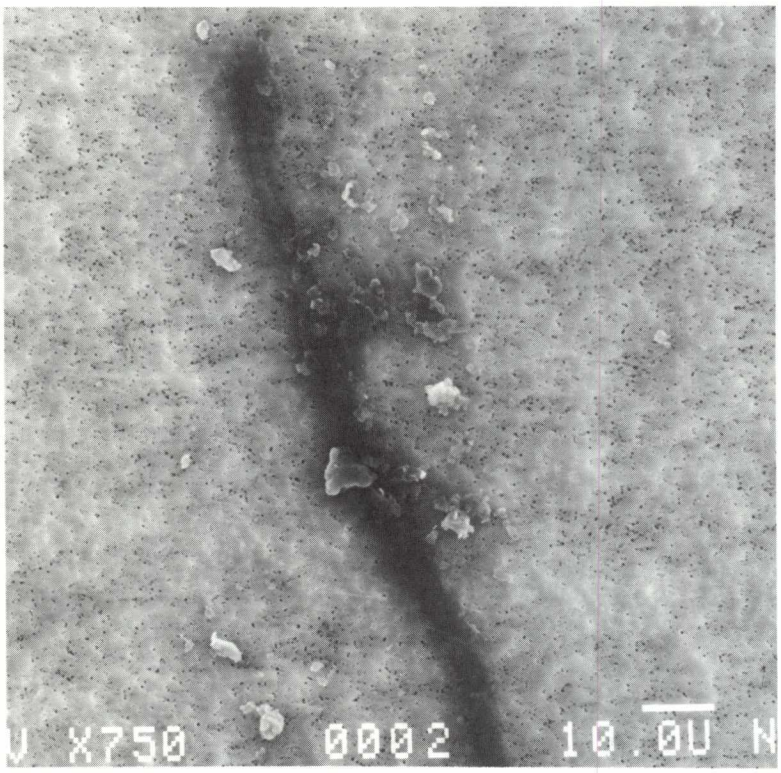
LUSTER: M

TYPE: TCA

COMMENTS:
Related to L2011 H2



L2011 H 2



S-92-35021

SIZE: 12x8

SHAPE: I

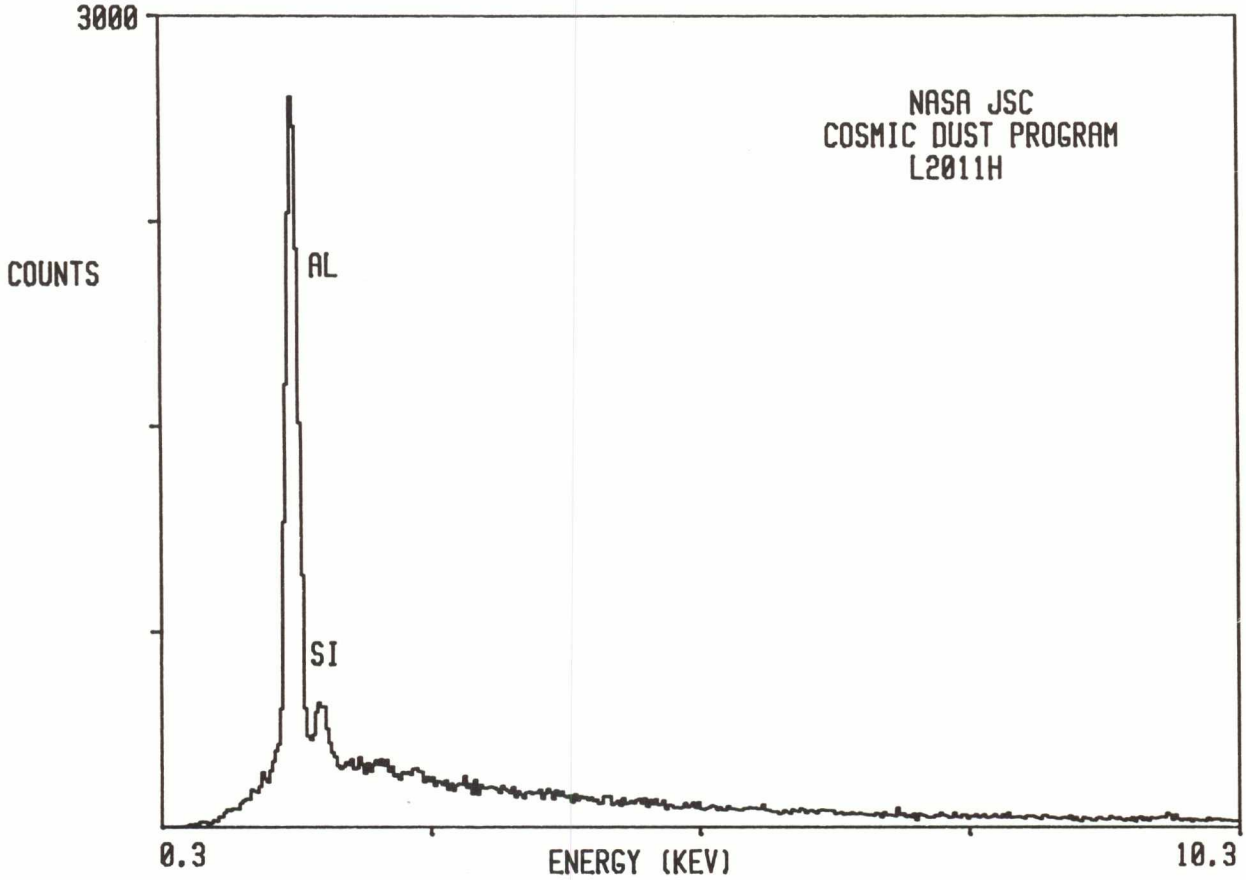
TRANS.: O

COLOR: Black

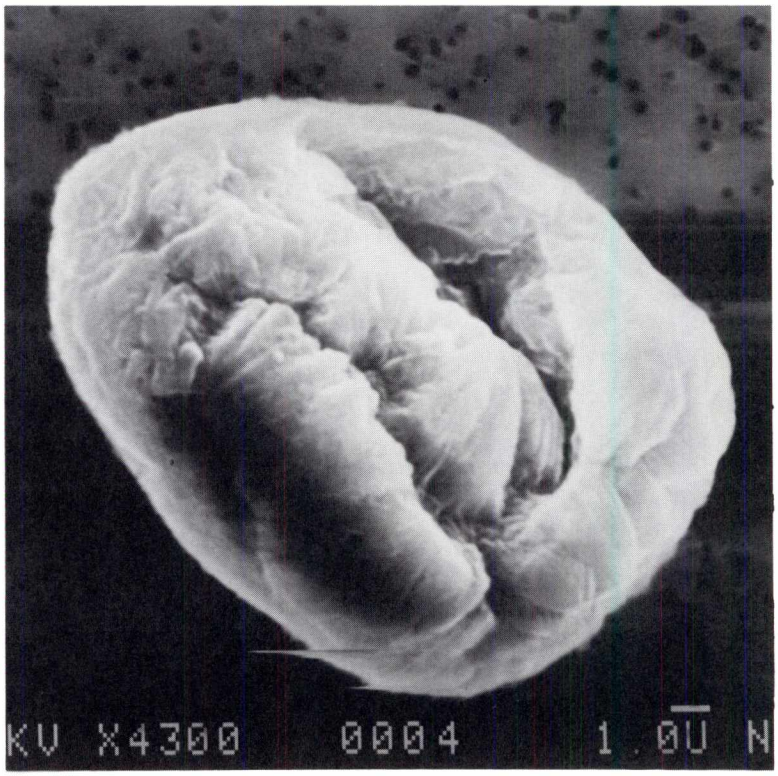
LUSTER: D

TYPE: TCA

COMMENTS:
Related to L2011 H1



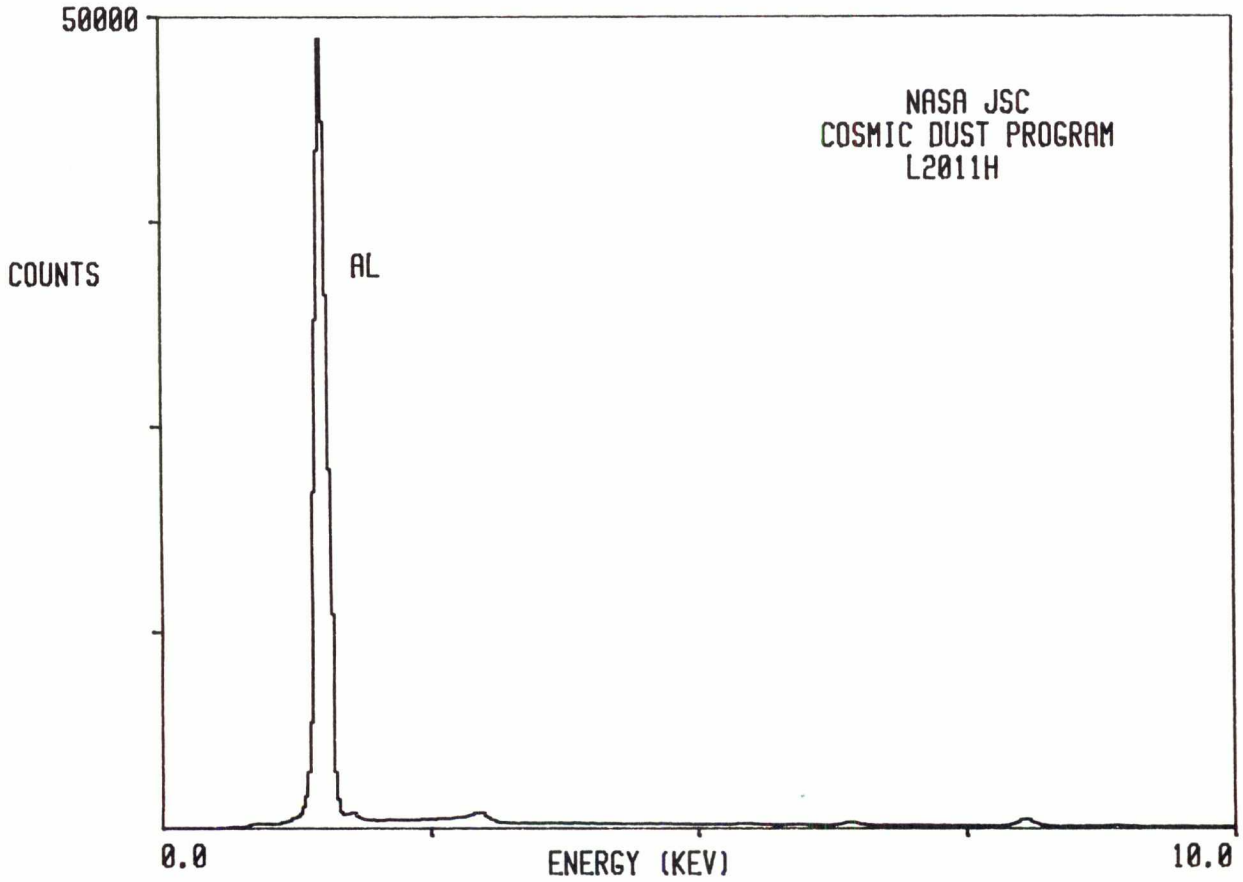
L2011 H 4



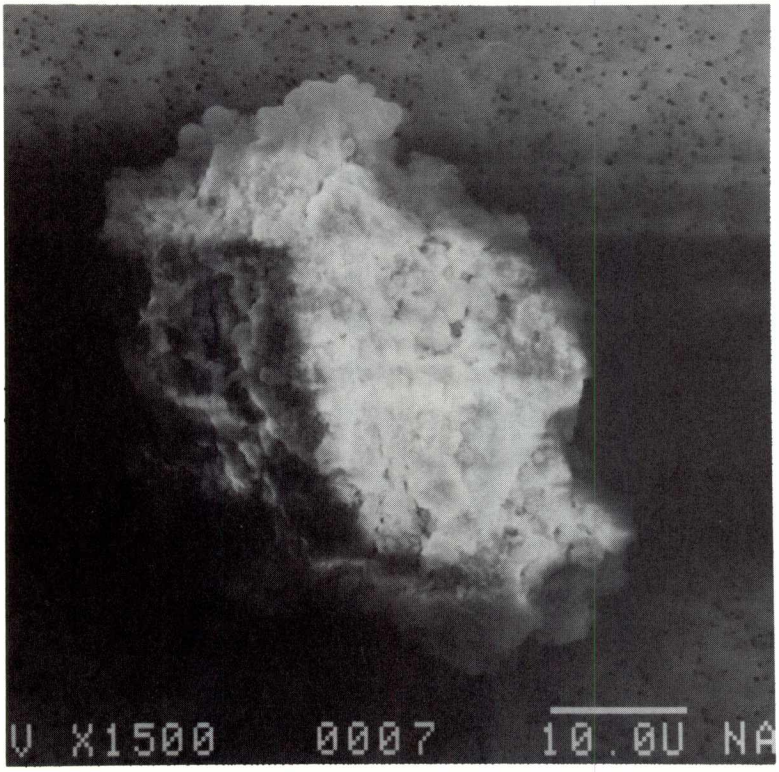
S-92-35834

SIZE: 36x12
SHAPE: E
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA

COMMENTS:



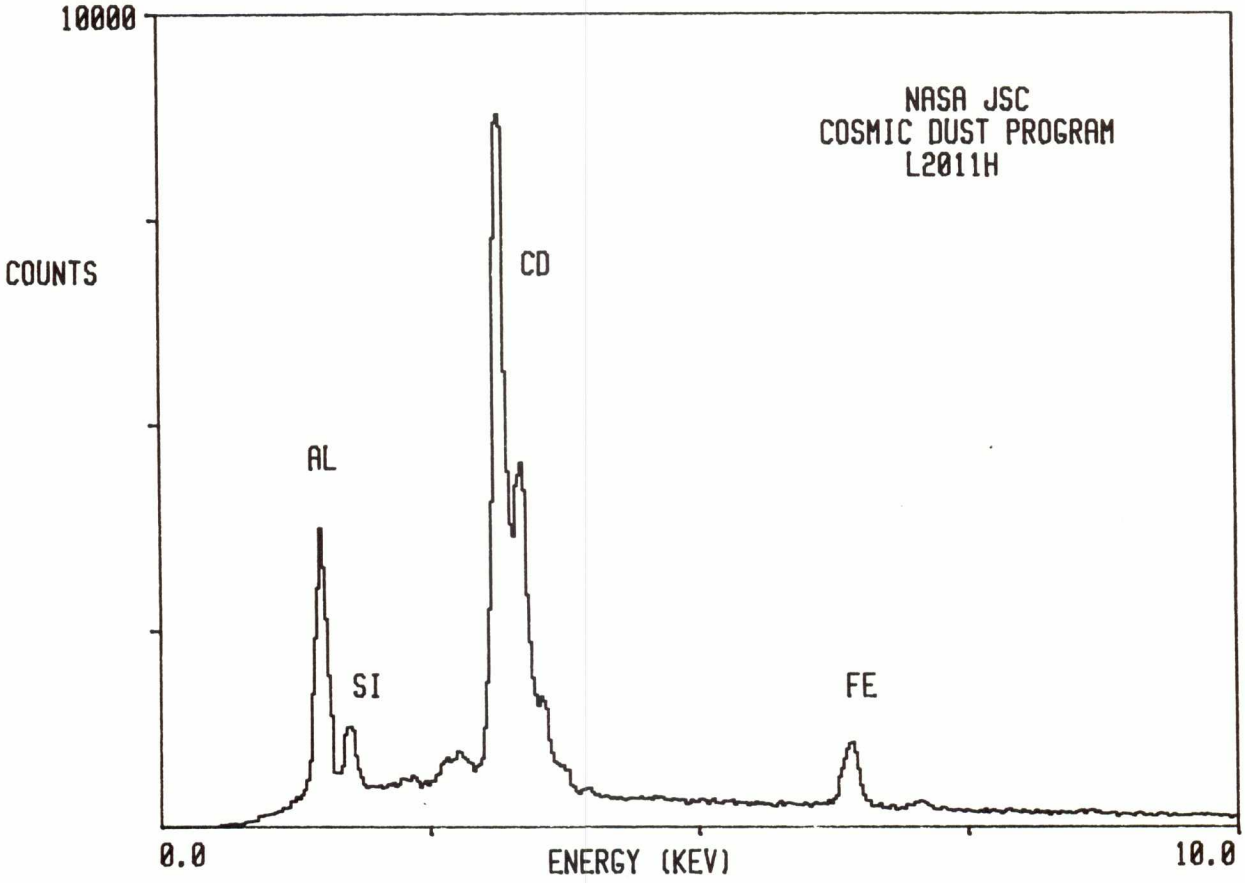
L2011 H 5



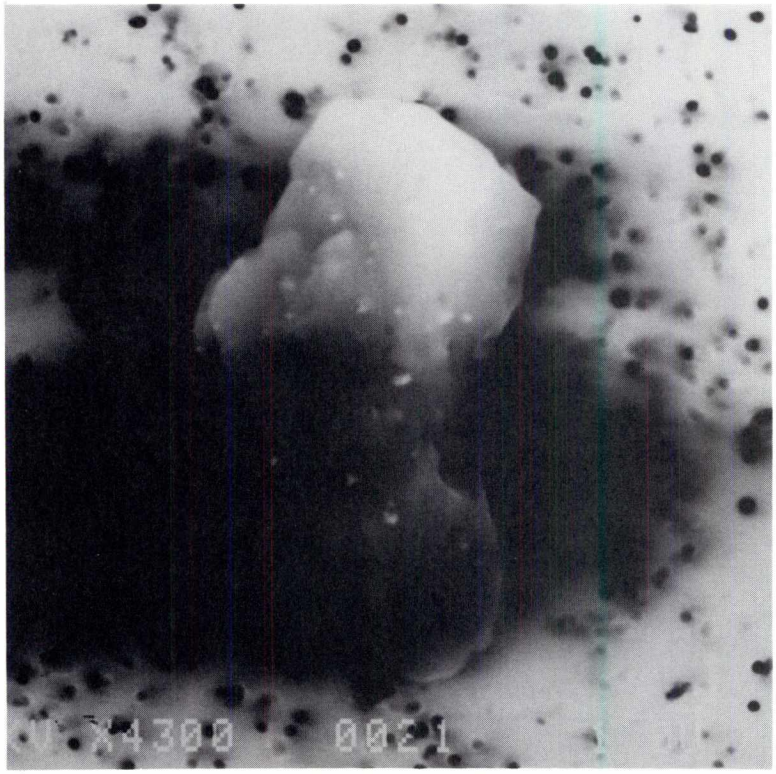
S-92-35835

SIZE: 48x40
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



L2011 H 6



S-92-35836

SIZE: 17x9

SHAPE: E

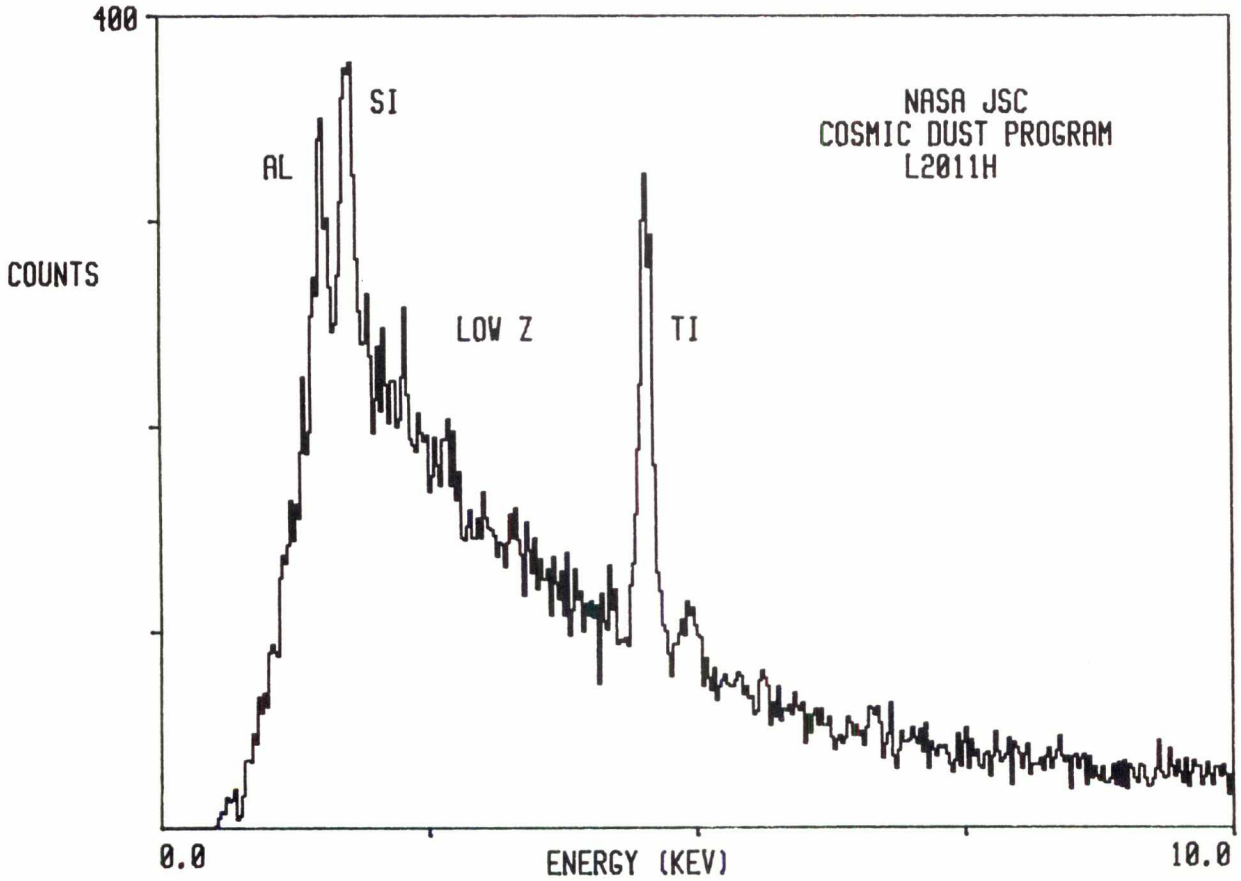
TRANS.: O

COLOR: Black

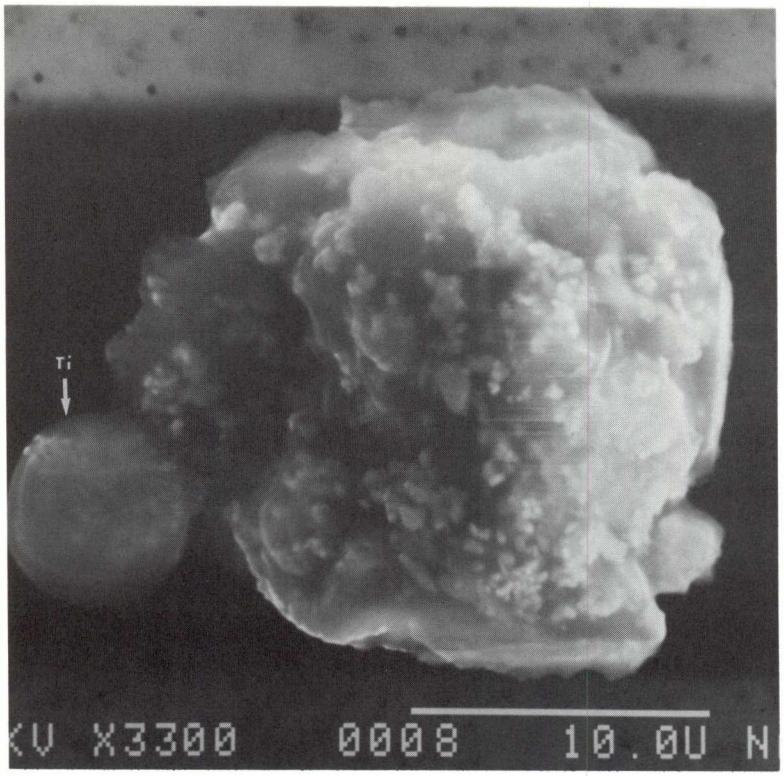
LUSTER: D

TYPE: TCA

COMMENTS:



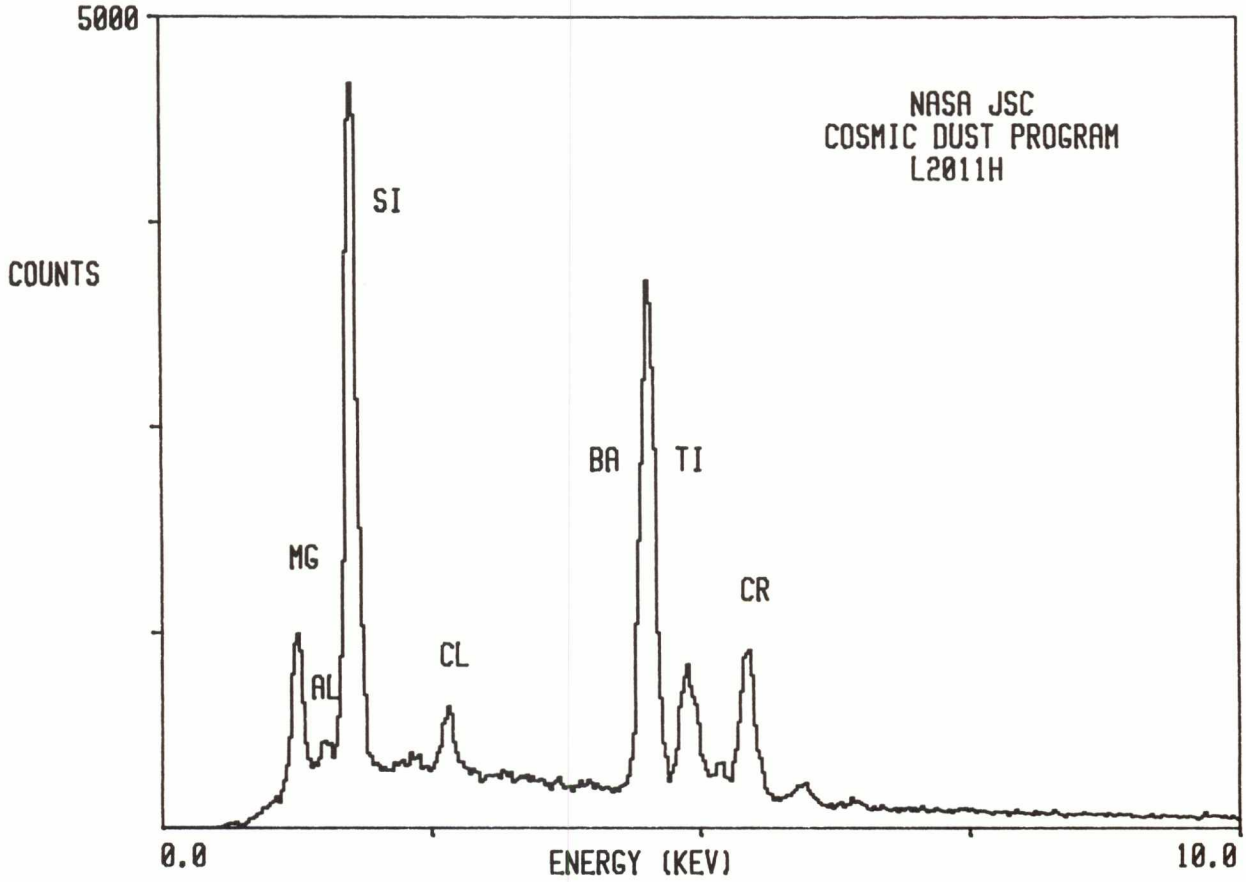
L2011 H 7



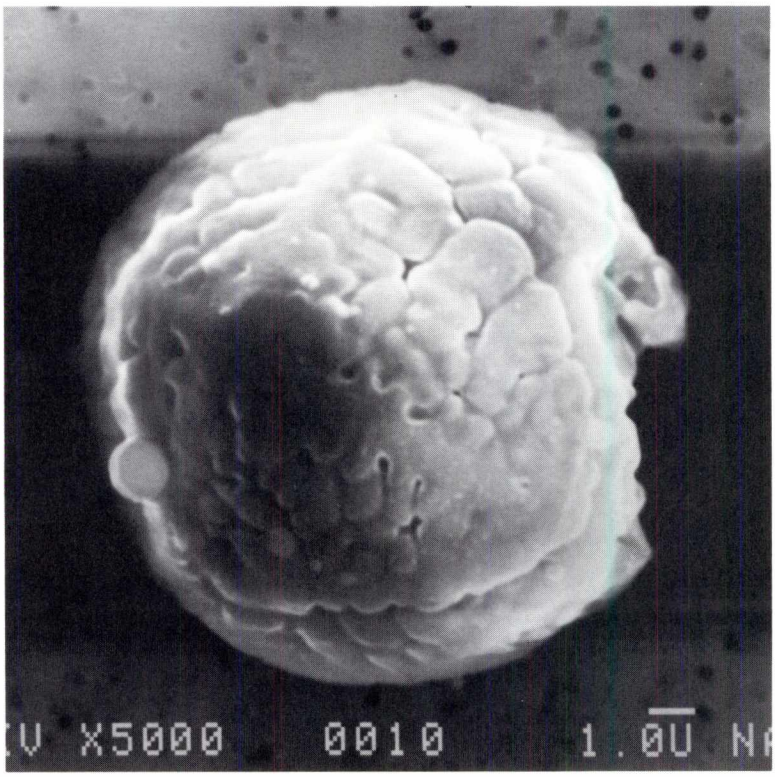
S-92-35837

SIZE: 24
SHAPE: S
TRANS.: O/T
COLOR: White
LUSTER: D
TYPE: TCA

COMMENTS:



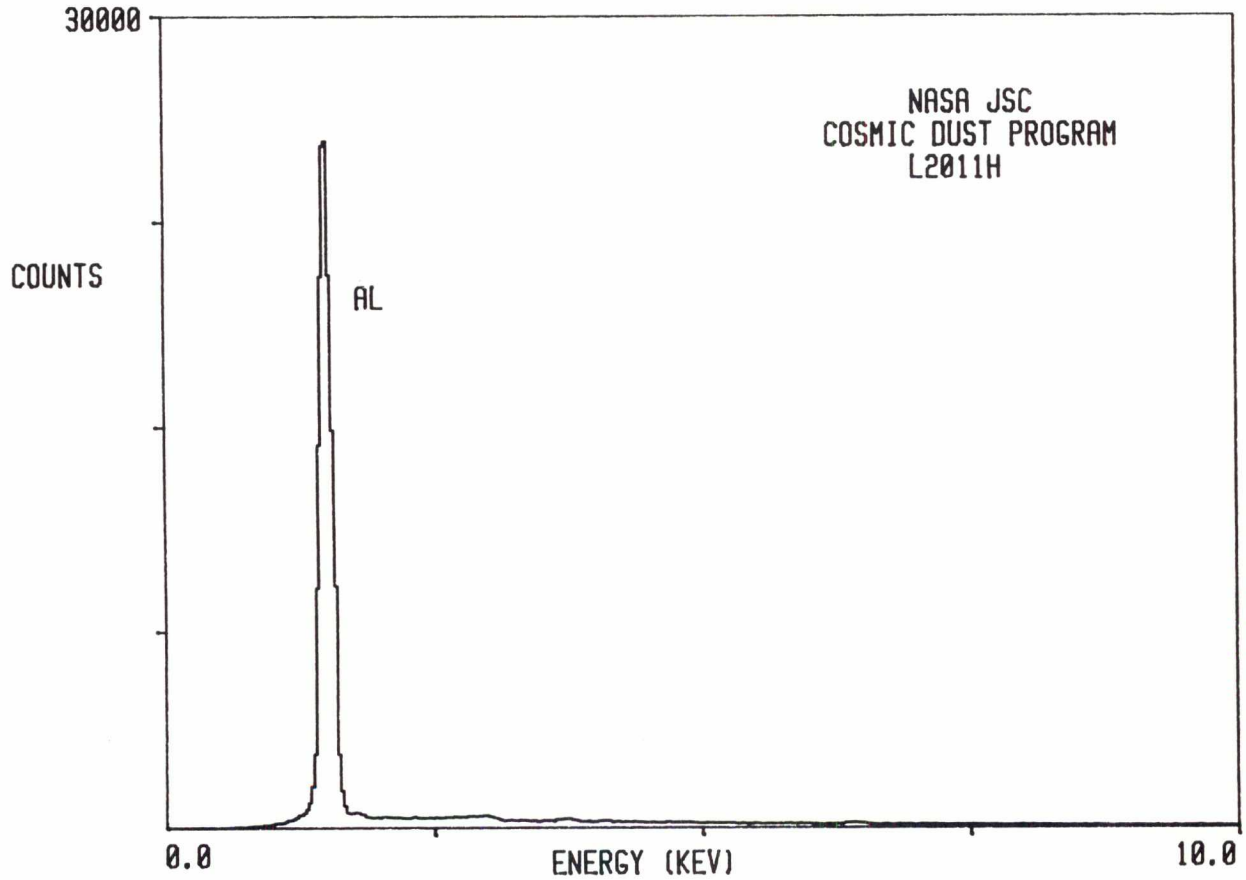
L2011 H 8



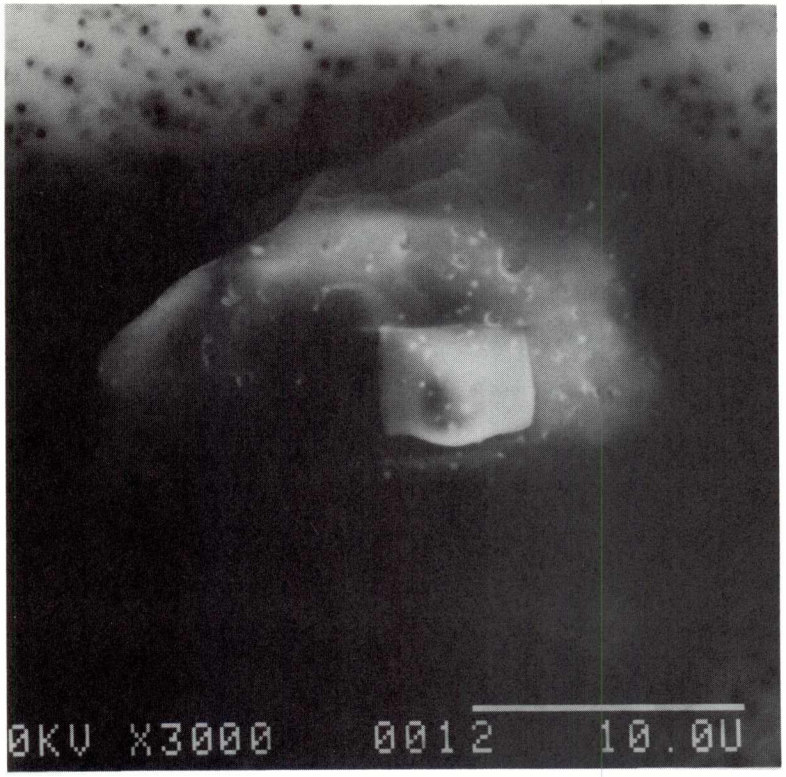
S-92-35838

SIZE: 9
SHAPE: S
TRANS.: O
COLOR: White
LUSTER: V
TYPE: TCA

COMMENTS:



L2011 H 9



S-92-35839

SIZE: 24x20

SHAPE: E

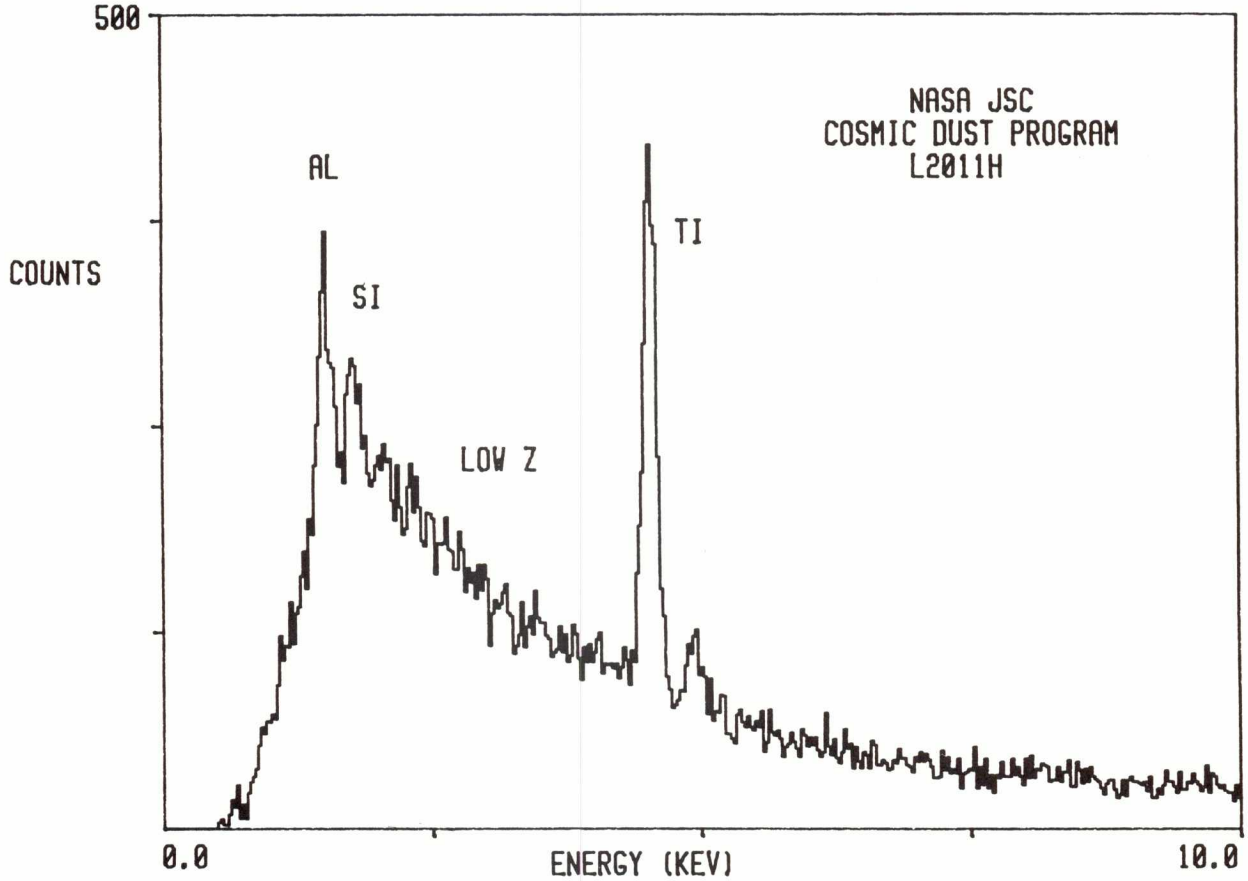
TRANS.: T

COLOR: Colorless

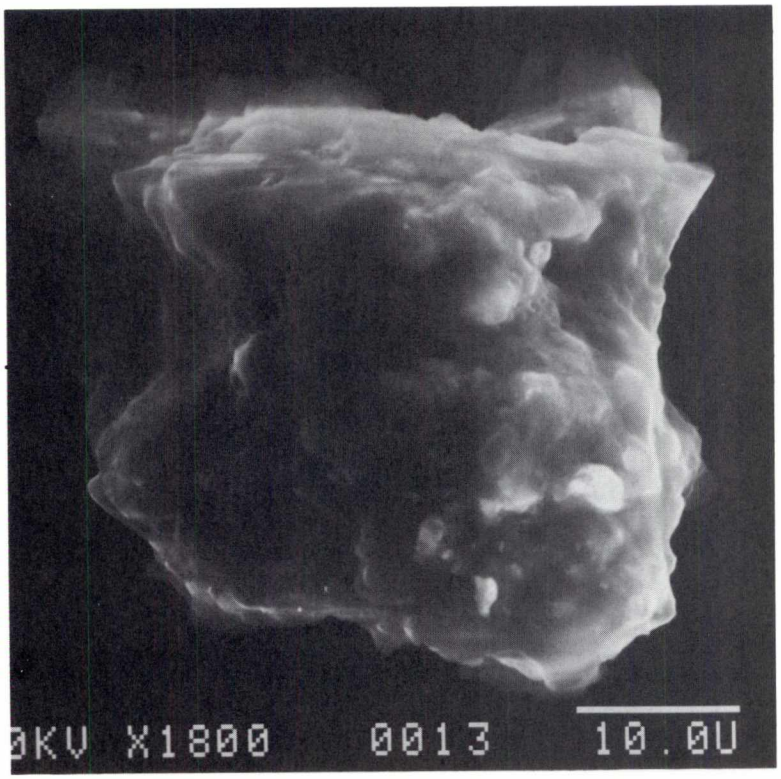
LUSTER: R

TYPE: TCA

COMMENTS:



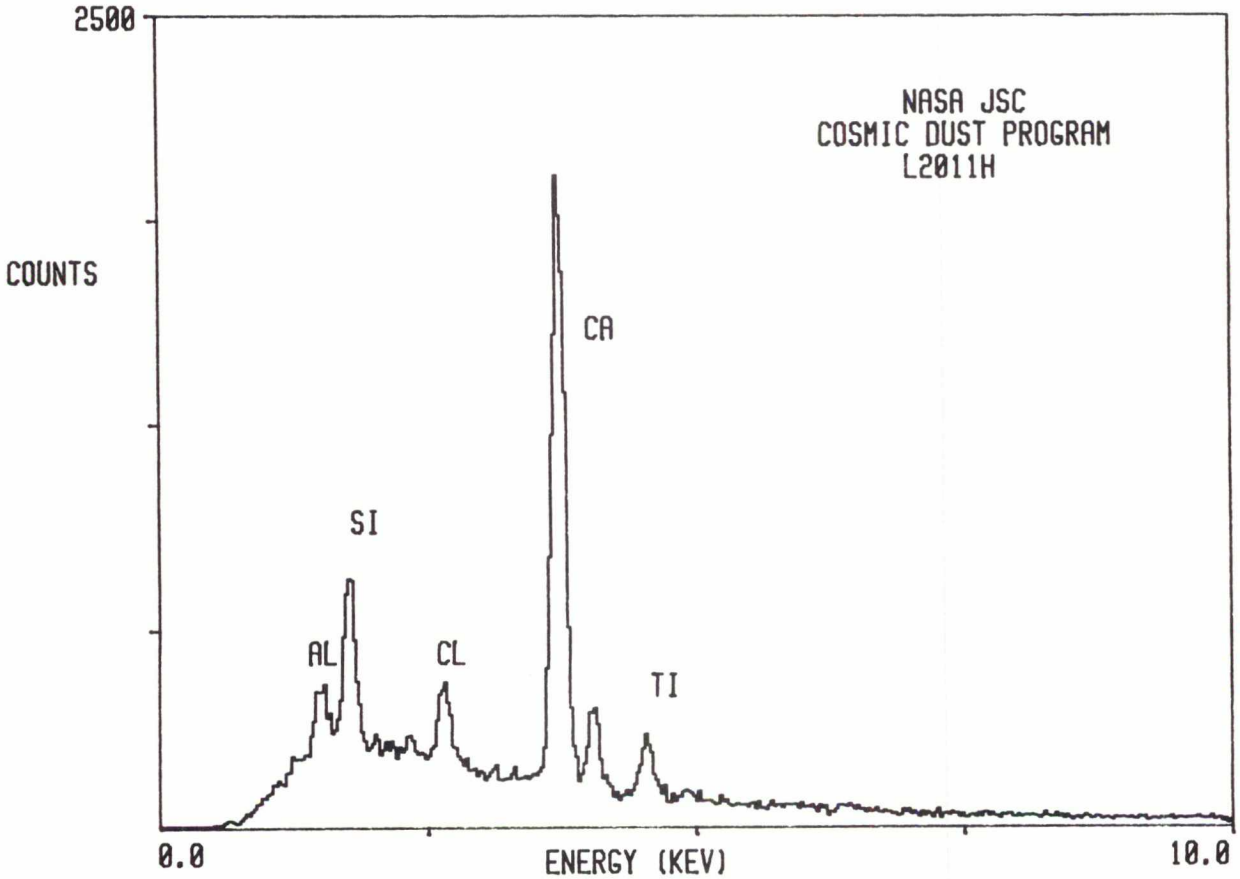
L2011 H 10



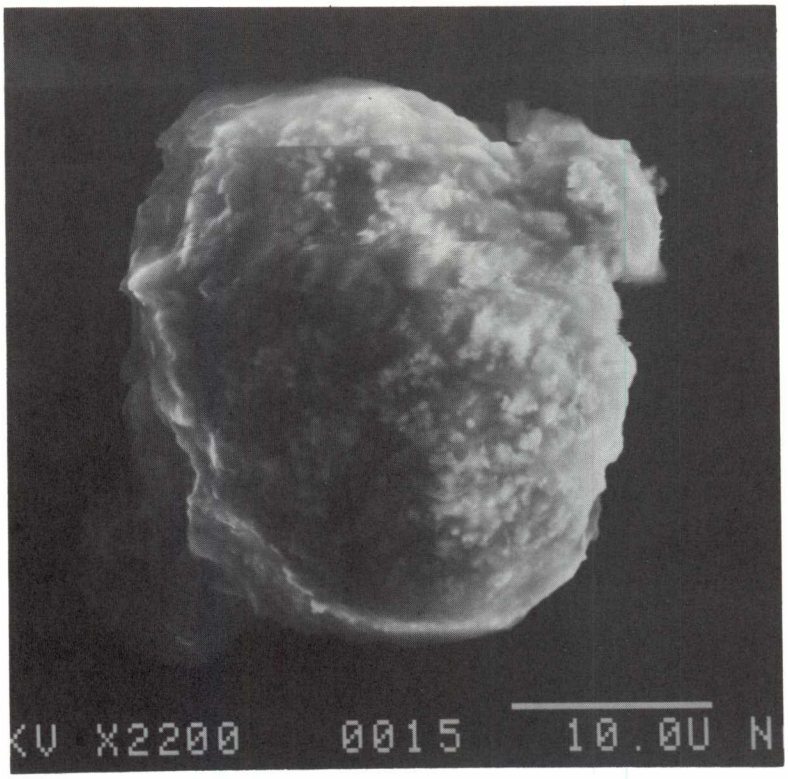
S-92-35840

SIZE: 44x40
SHAPE: E
TRANS.: TL
COLOR: White
LUSTER: R
TYPE: TCA?

COMMENTS:



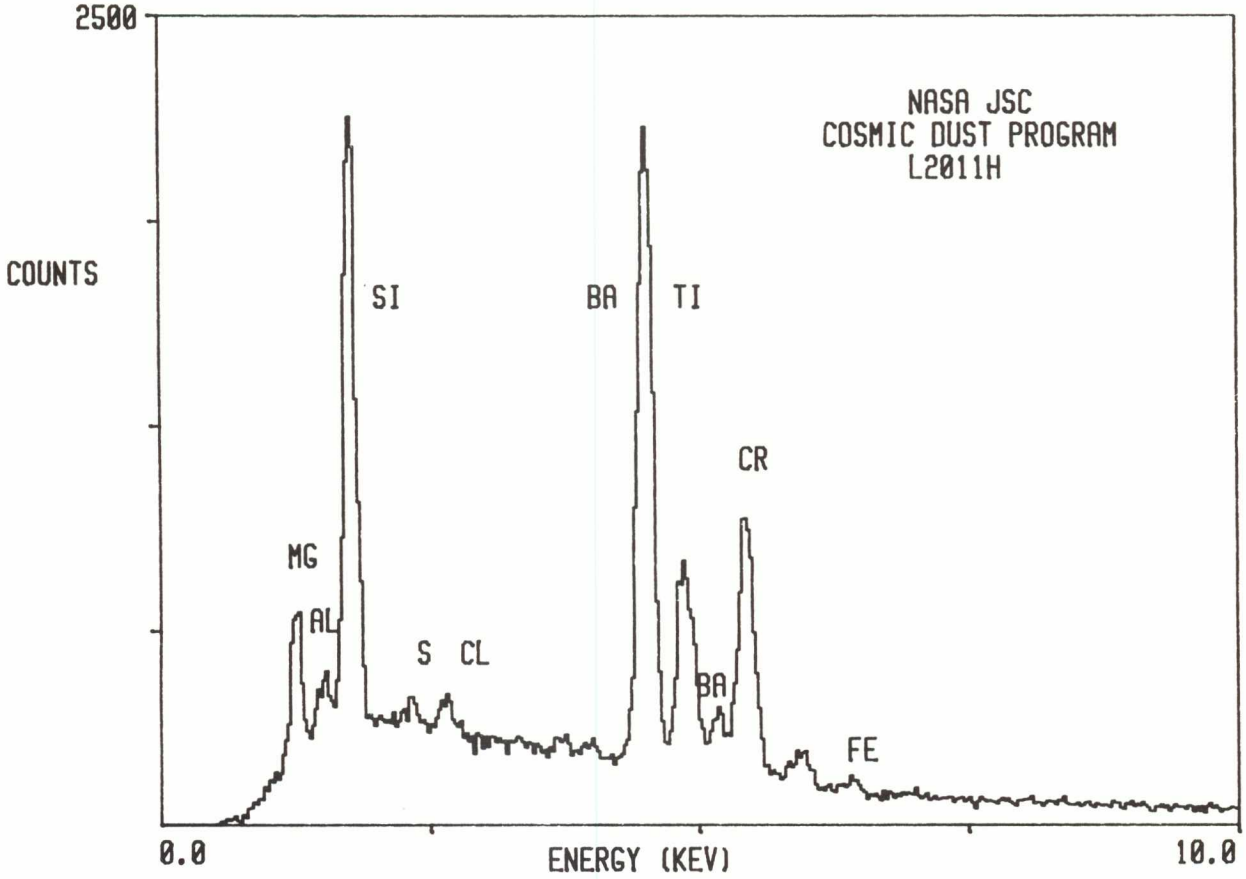
L2011 H 11



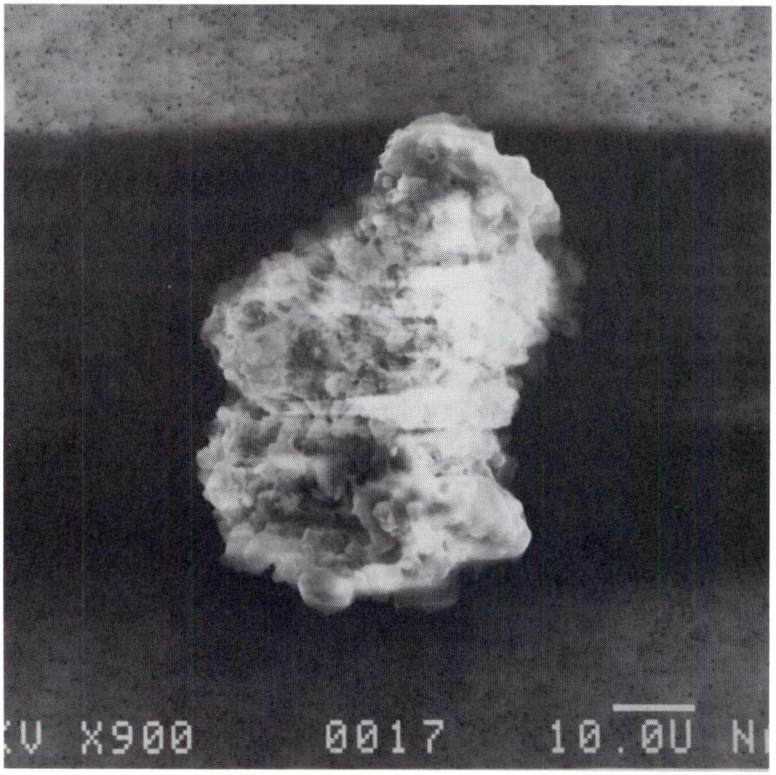
S-92-35841

SIZE: 40x35
SHAPE: E
TRANS.: TL
COLOR: White
LUSTER: R
TYPE: TCA

COMMENTS:



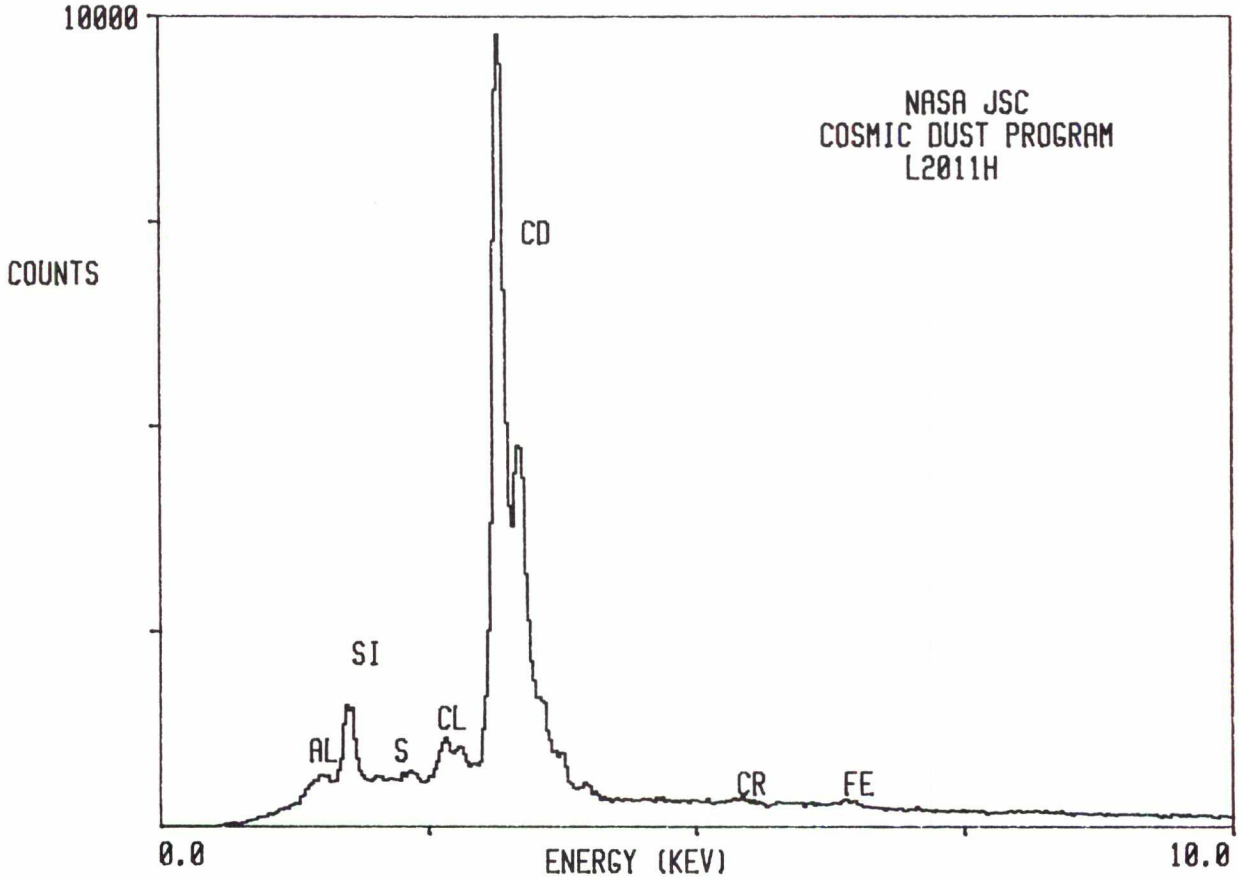
L2011 H 13



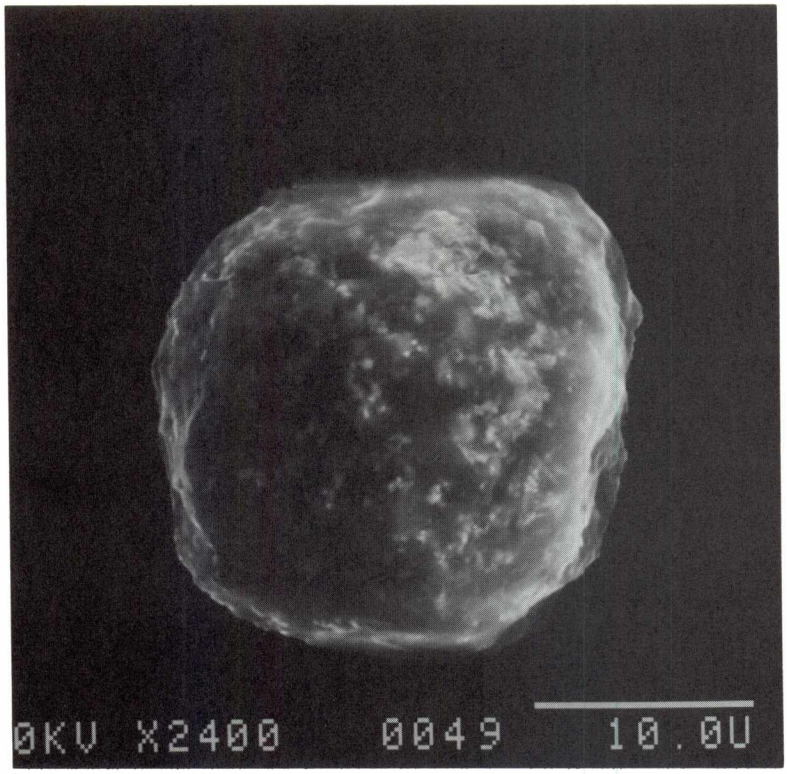
S-92-35843

SIZE: 66x28
SHAPE: E
TRANS.: TL
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



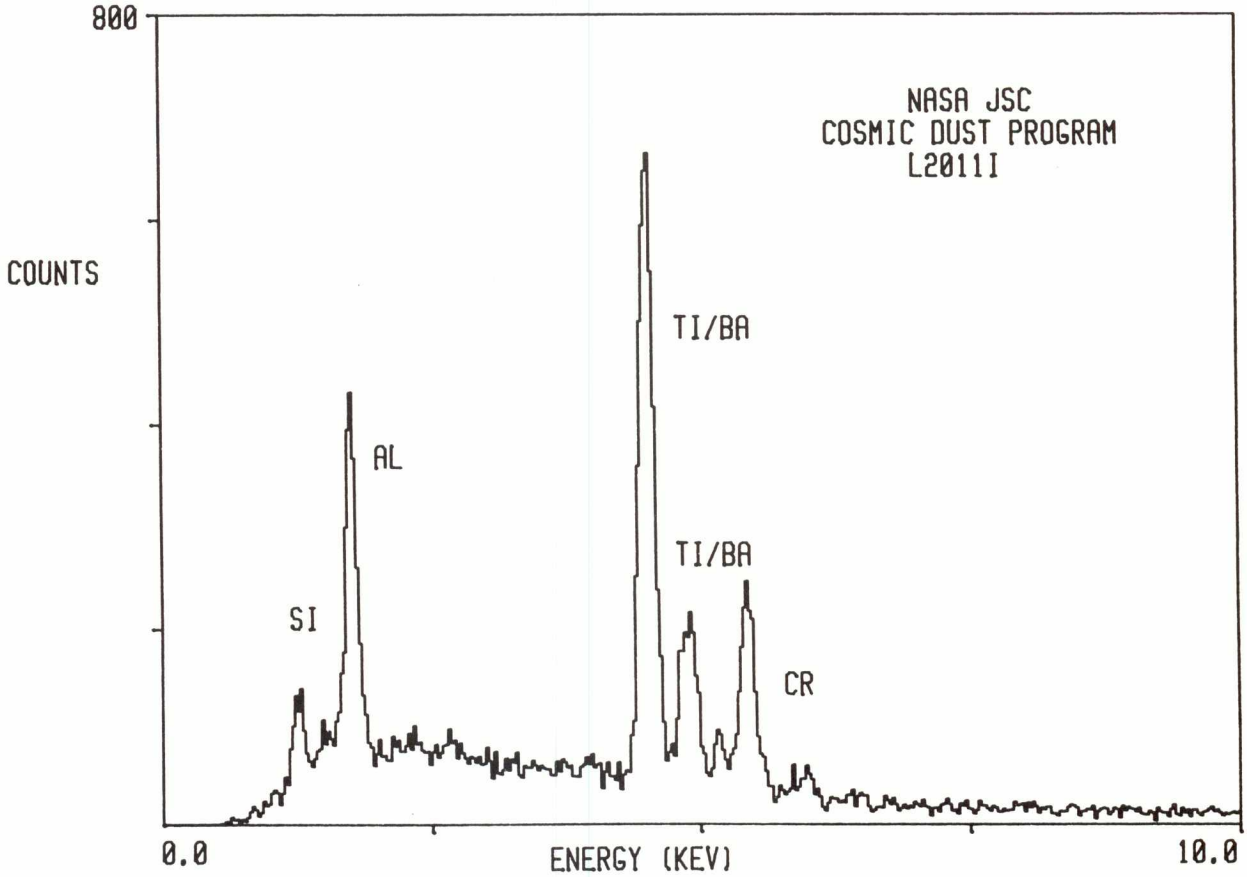
L2011 I 14



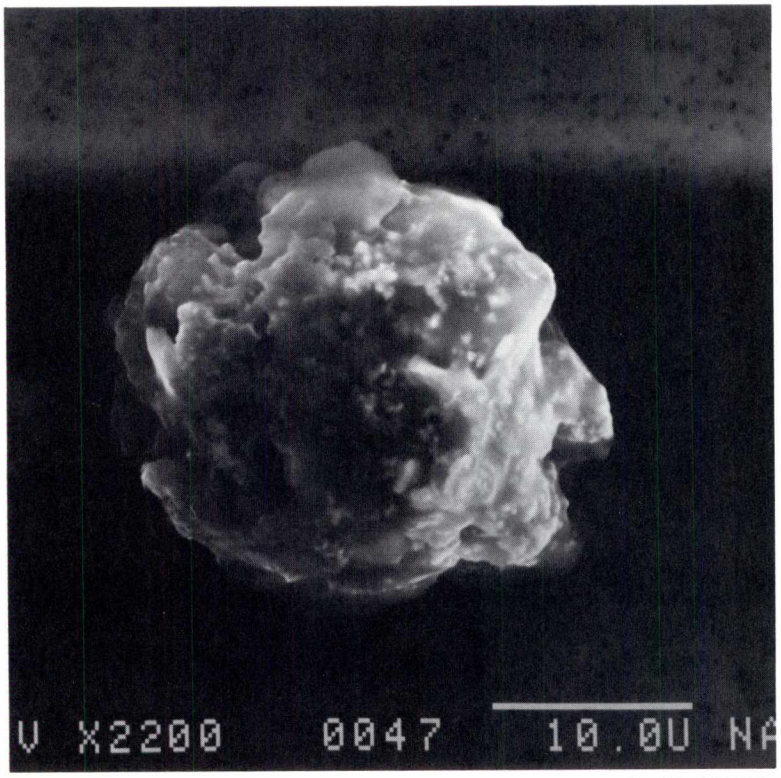
S-92-35822

SIZE: 31
SHAPE: S
TRANS.: TL
COLOR: White
LUSTER: V
TYPE: TCA

COMMENTS:



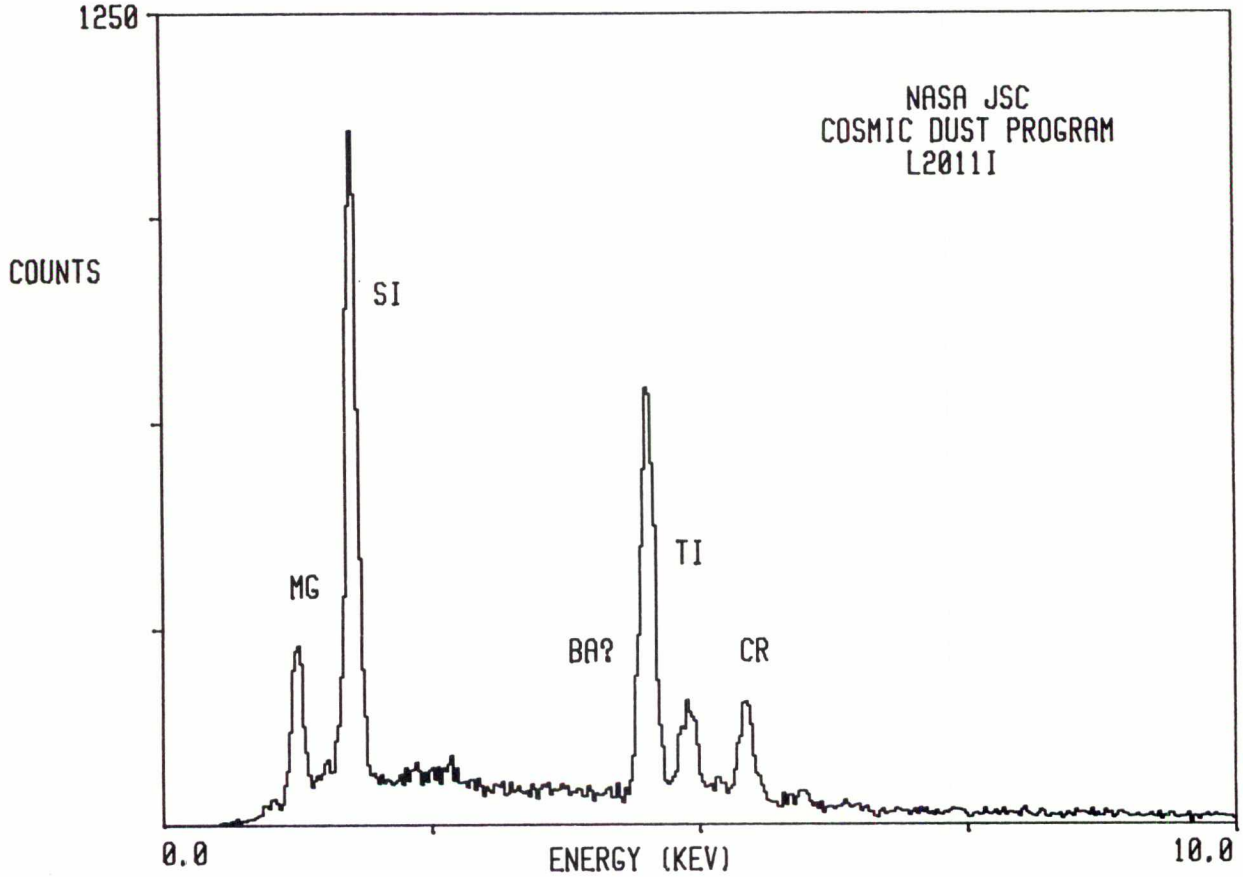
L2011 I 16



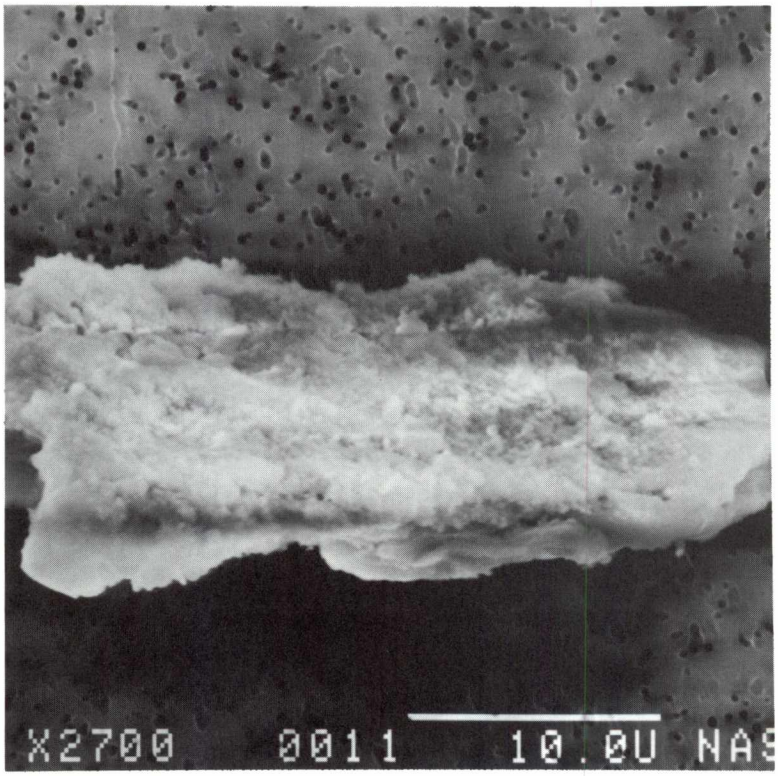
S-92-35830

SIZE: 30
SHAPE: E/S
TRANS.: TL
COLOR: White
LUSTER: V
TYPE: TCA

COMMENTS:



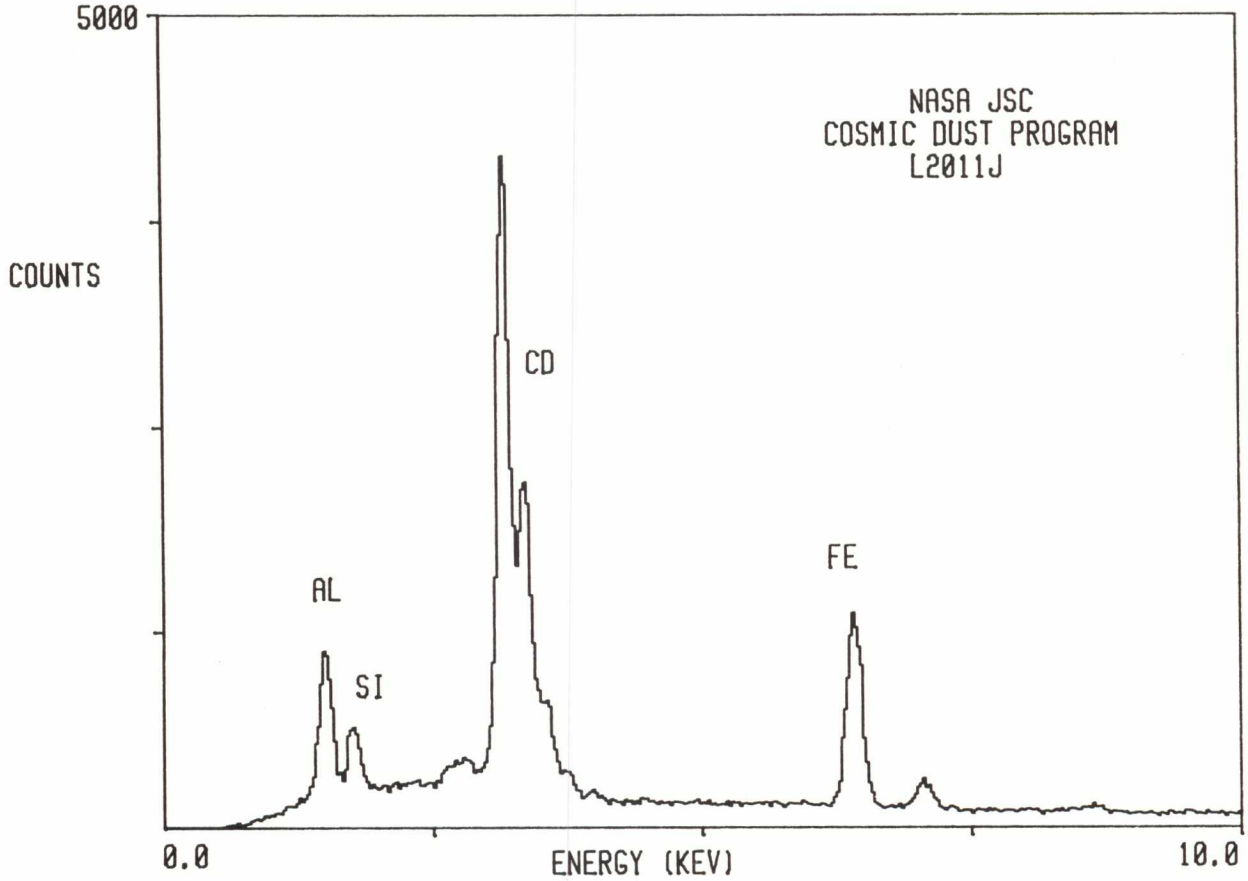
L2011 J 5



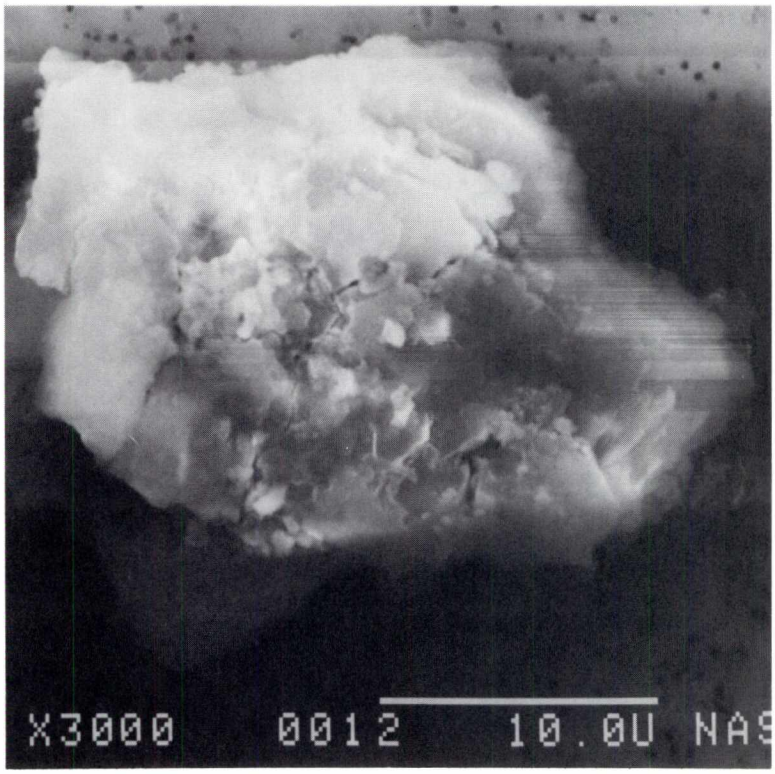
S-92-35804

SIZE: 36x30
SHAPE: E
TRANS.: TL
COLOR: White
LUSTER: R
TYPE: TCA

COMMENTS:



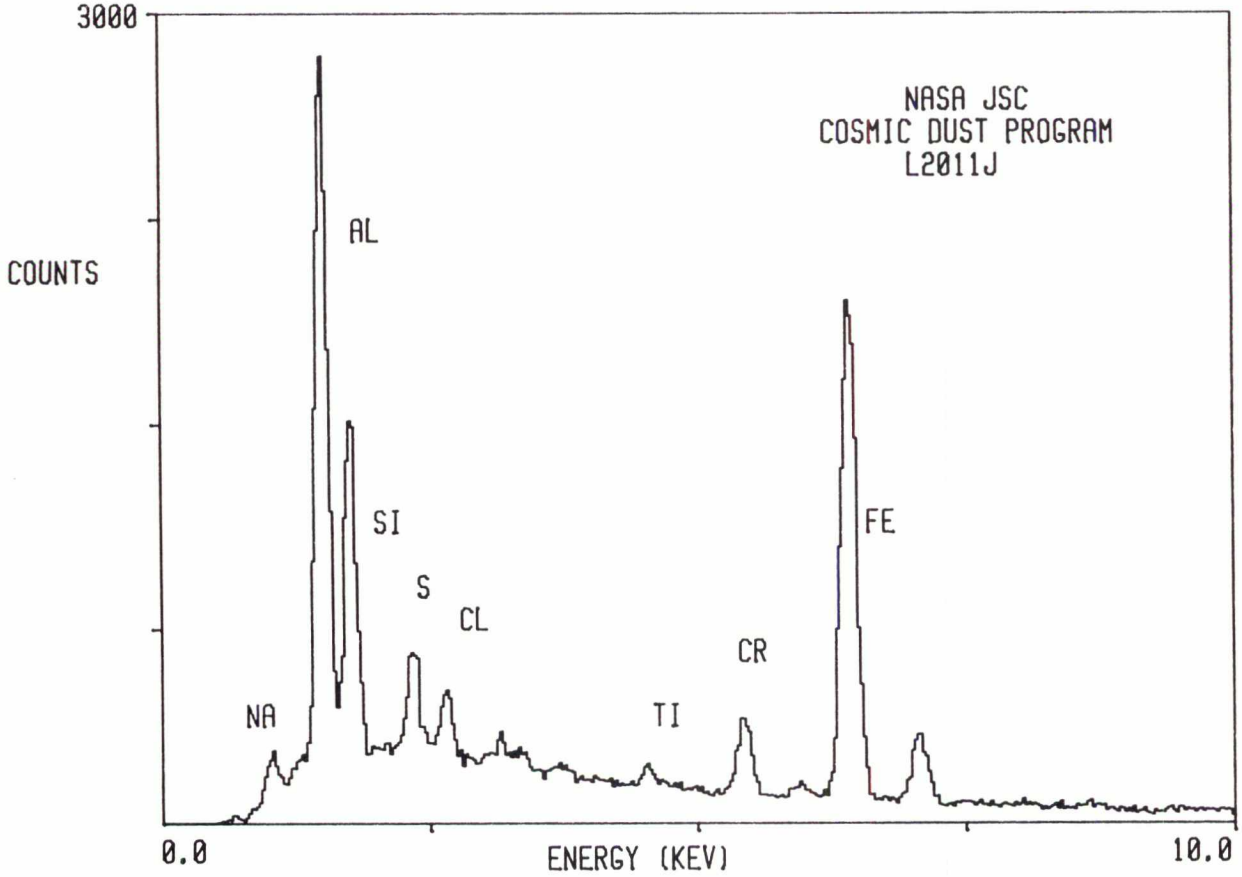
L2011 J 6



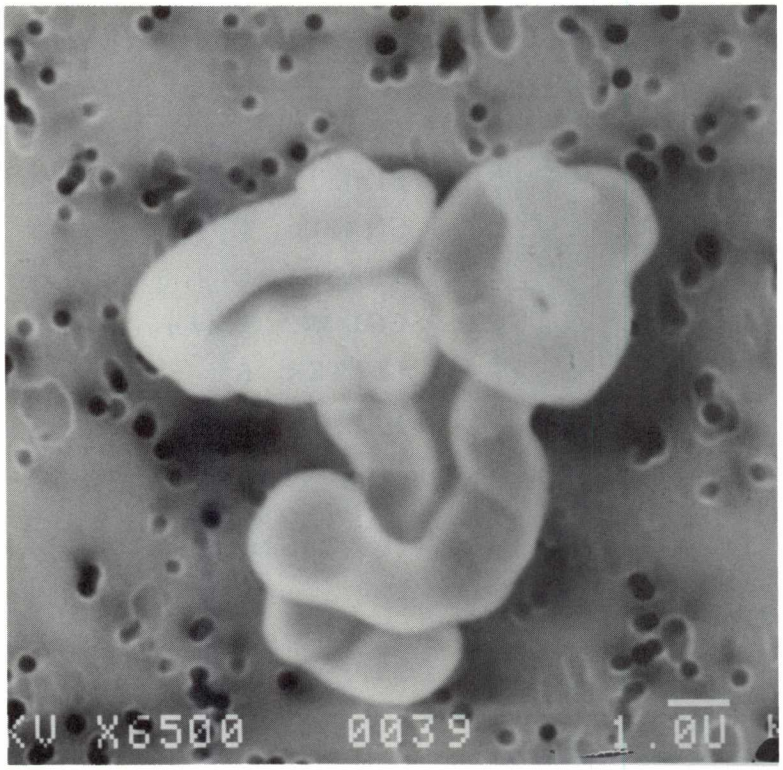
S-92-35805

SIZE: 28x22
SHAPE: E
TRANS.: TL
COLOR: Colorless
LUSTER: V
TYPE: TCA

COMMENTS:



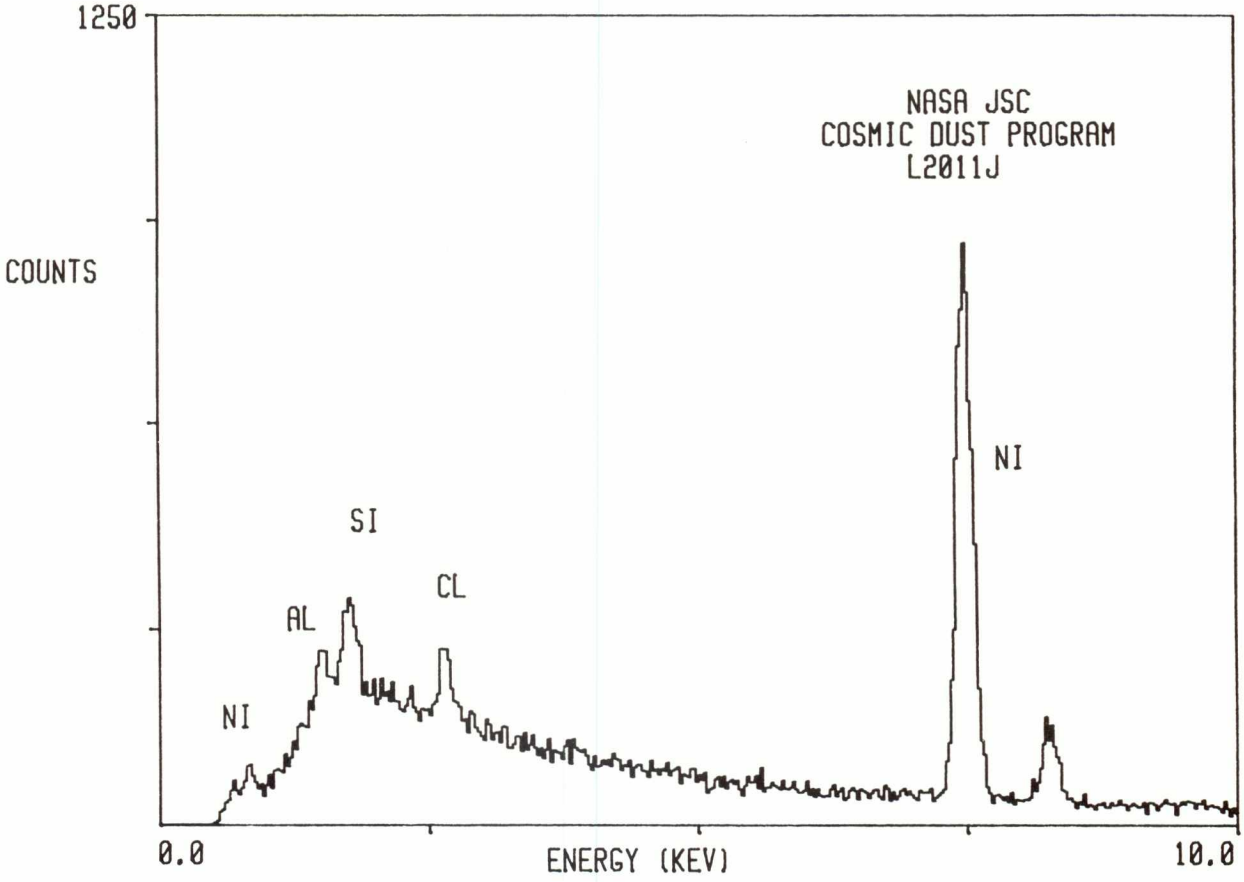
L2011 J 8



S-92-35807

SIZE: 10x8
SHAPE: S
TRANS.: TL
COLOR: Red
LUSTER: V
TYPE: TCA

COMMENTS:



L2011 J 10

S-92-35809

SIZE: 32x16

SHAPE: I

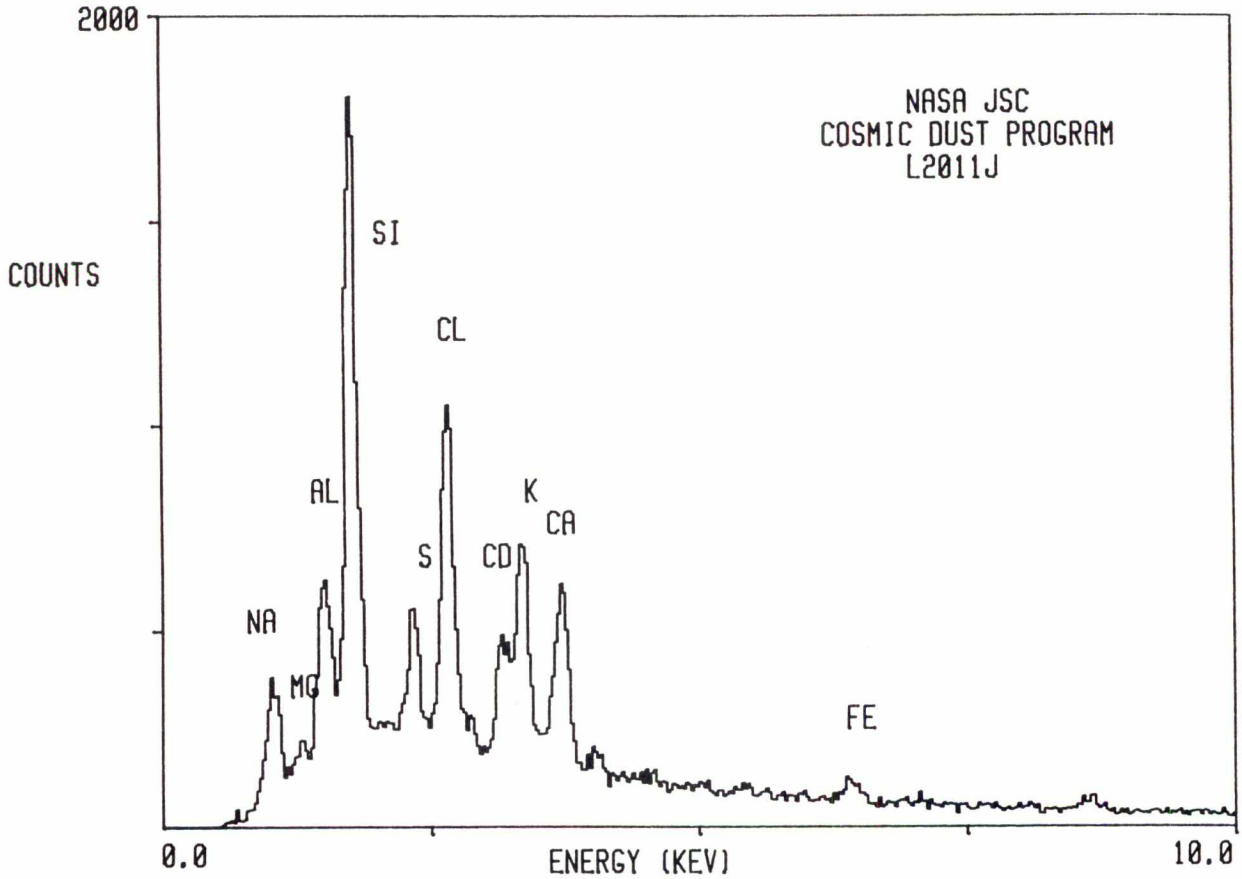
TRANS.: O

COLOR: Brown

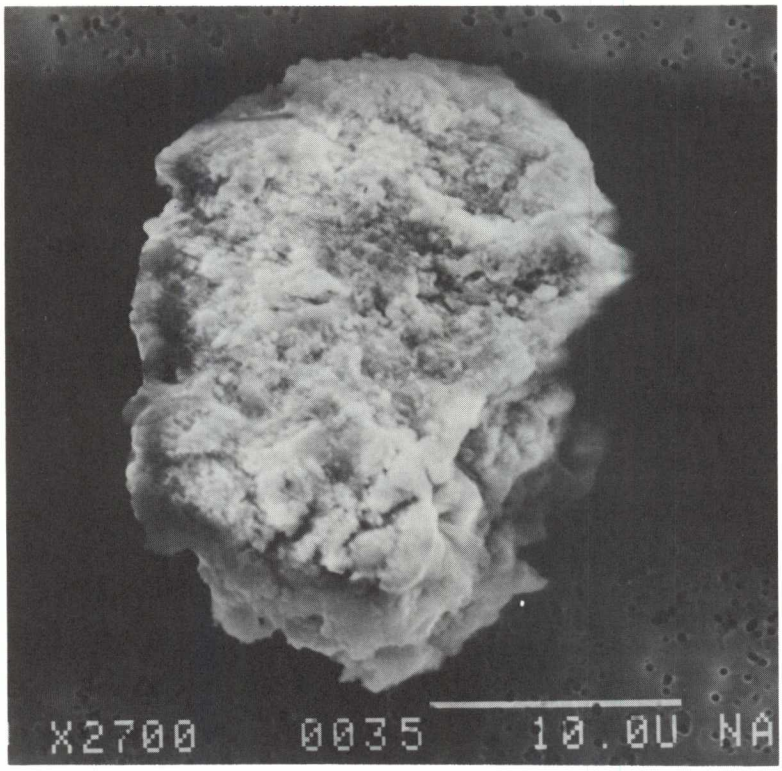
LUSTER: R

TYPE: TCA

COMMENTS:
Largest grain is 32x16 microns



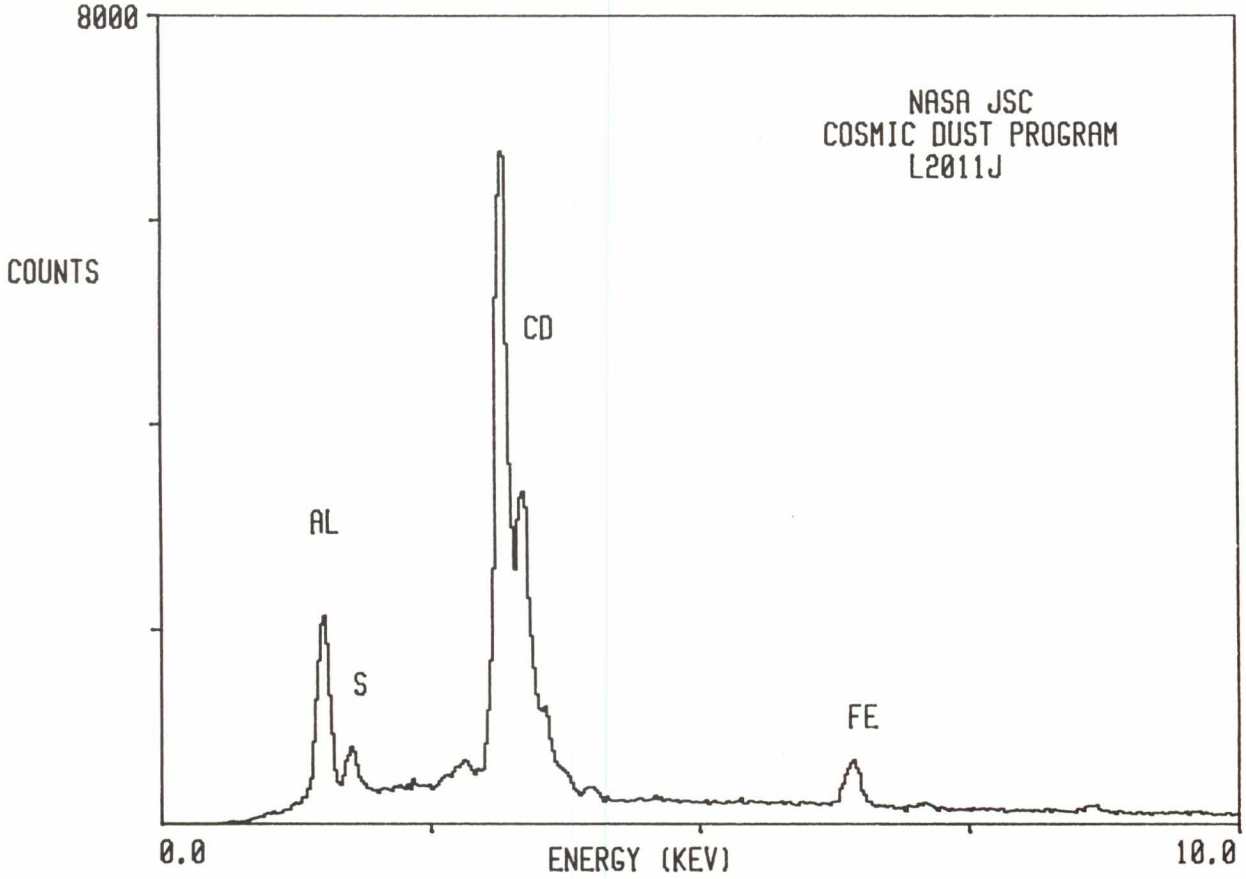
L2011 J 15



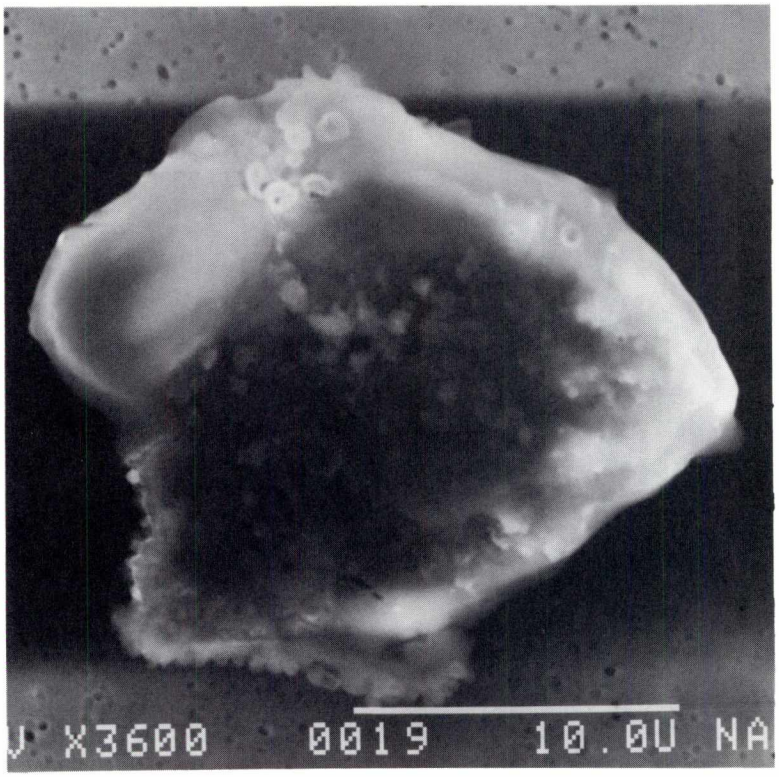
S-92-35814

SIZE: 28x20
SHAPE: I
TRANS.: O
COLOR: White
LUSTER: D
TYPE: TCA

COMMENTS:



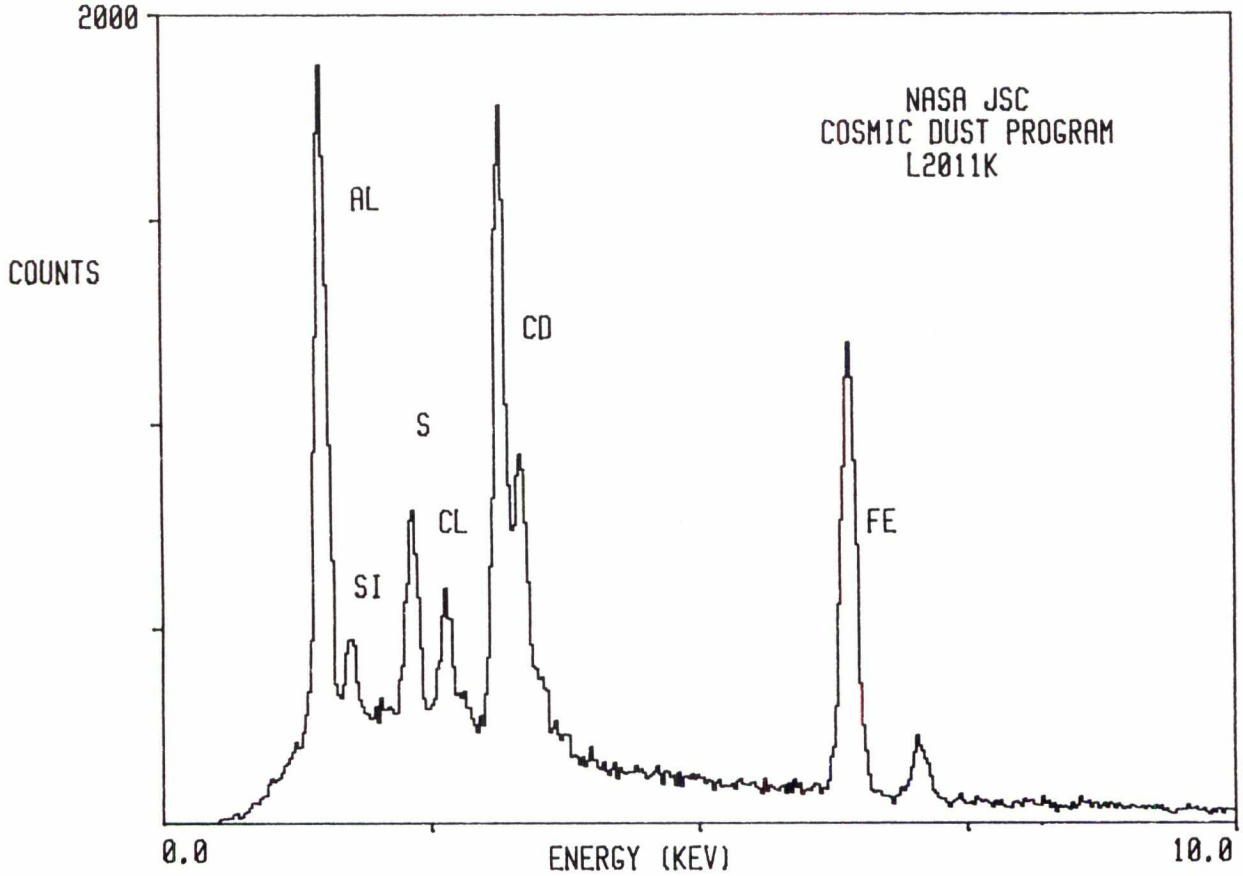
L2011 K 4



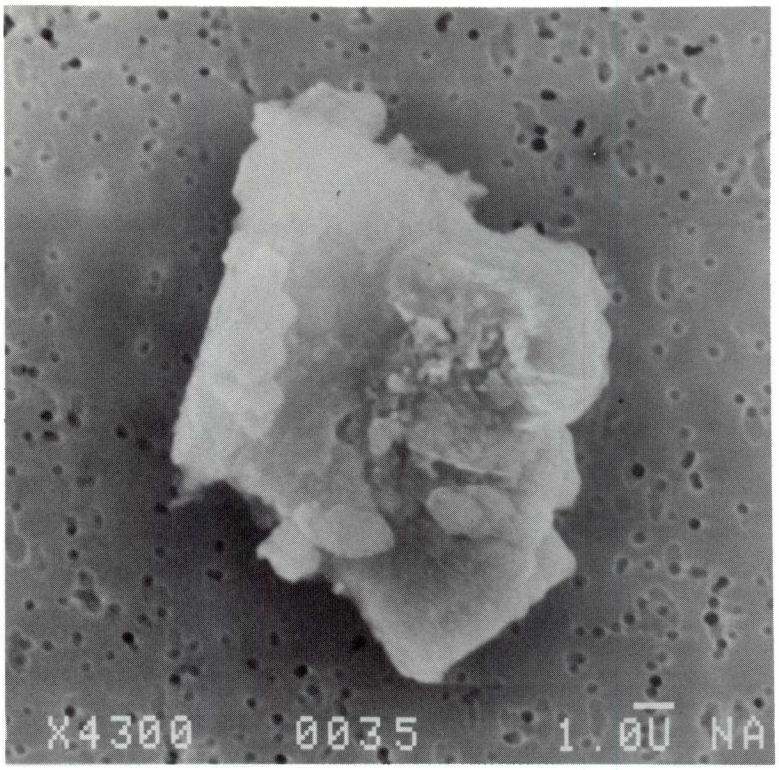
S-92-35786

SIZE: 22x20
SHAPE: E/I
TRANS.: O
COLOR: Brown to Blue
LUSTER: D
TYPE: TCA

COMMENTS:



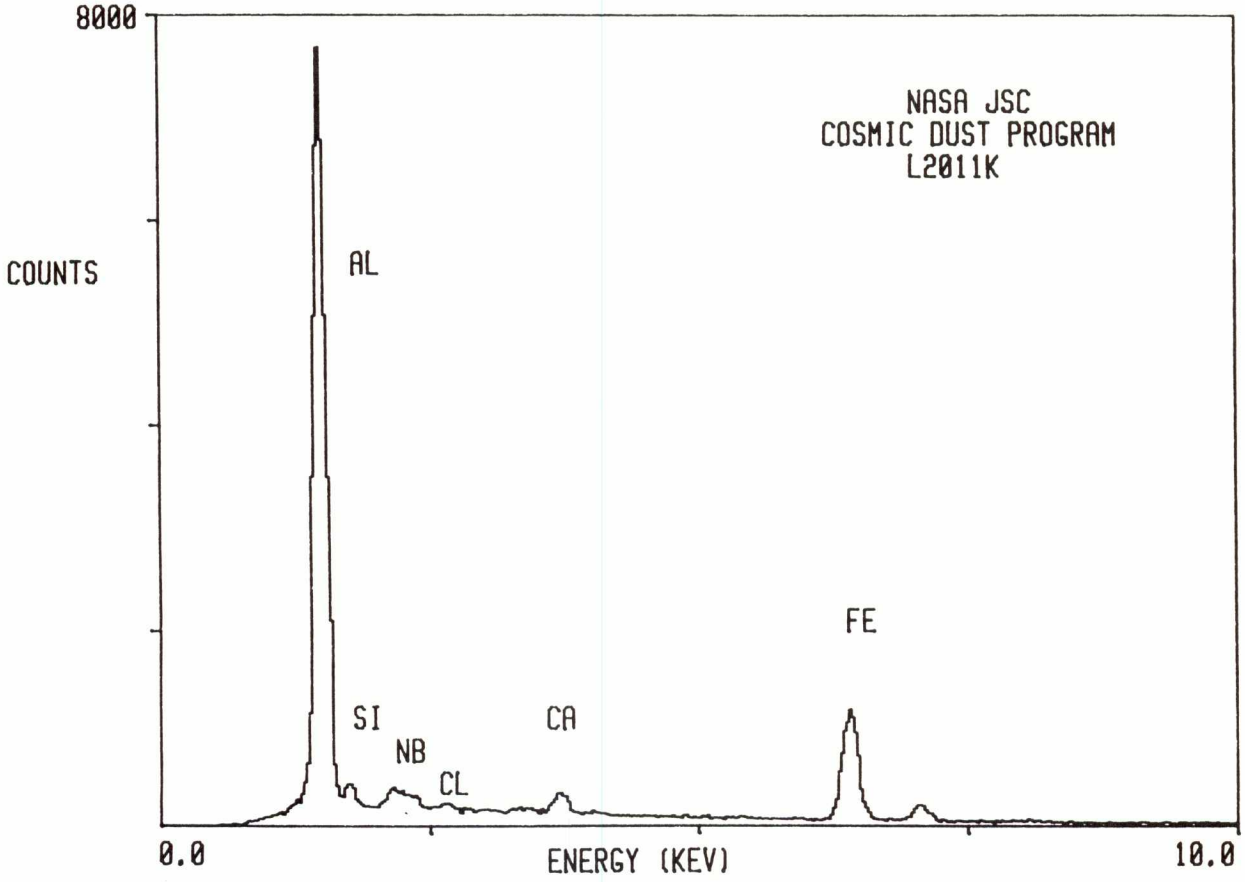
L2011 K 11



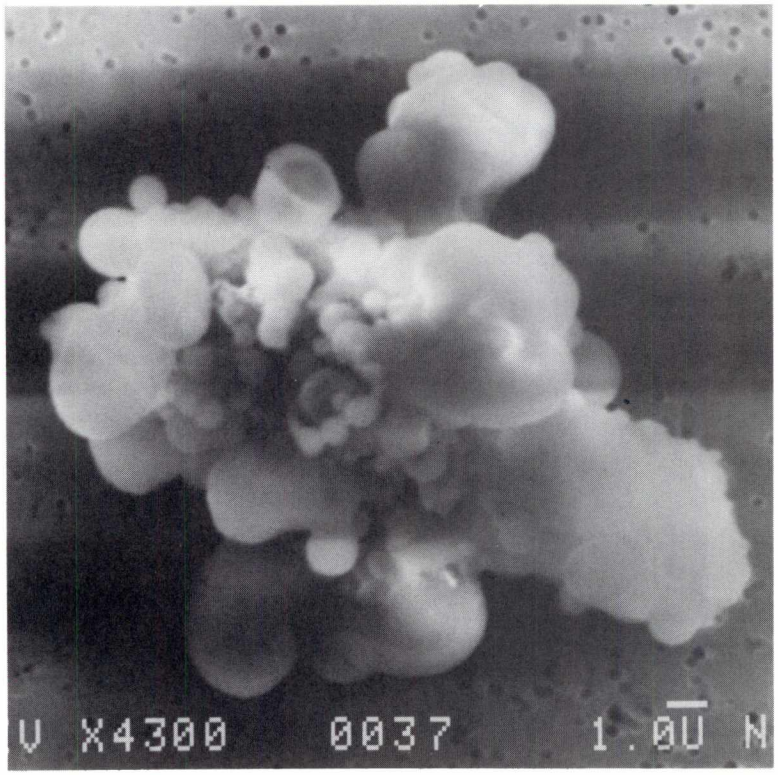
S-92-35793

SIZE: 12x11
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: TCA

COMMENTS:



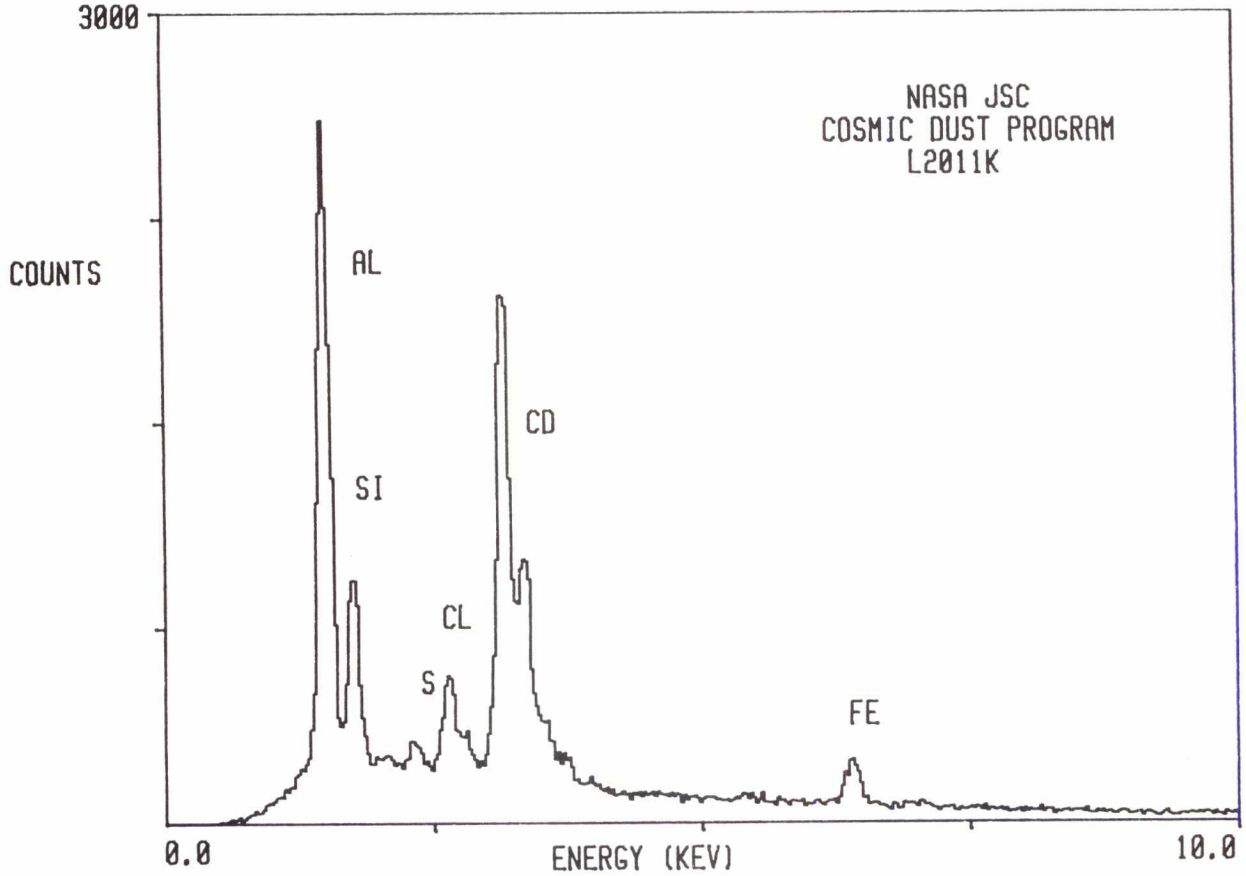
L2011 K 12



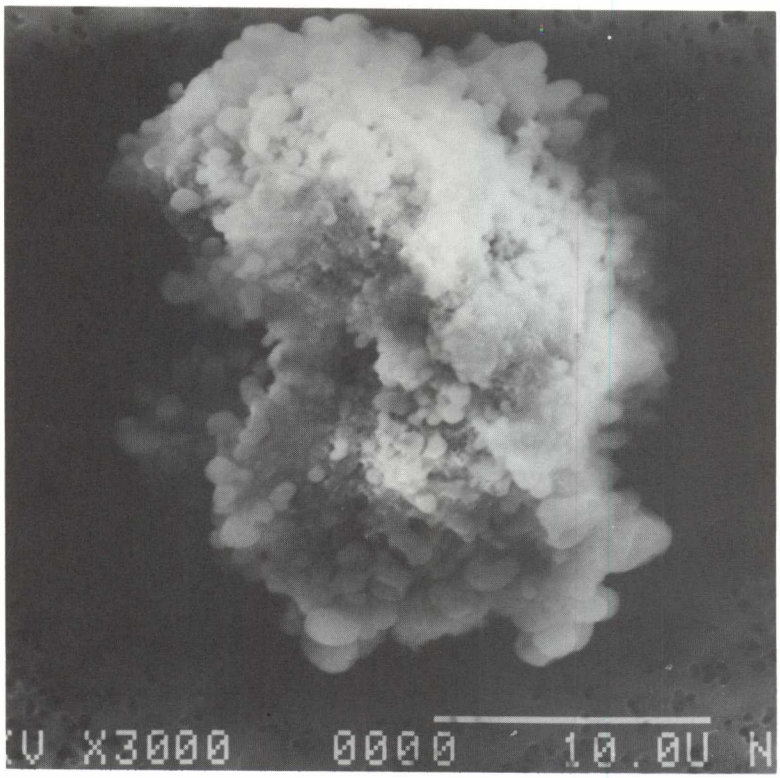
S-92-35794

SIZE: 20x14
SHAPE: I
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA

COMMENTS:



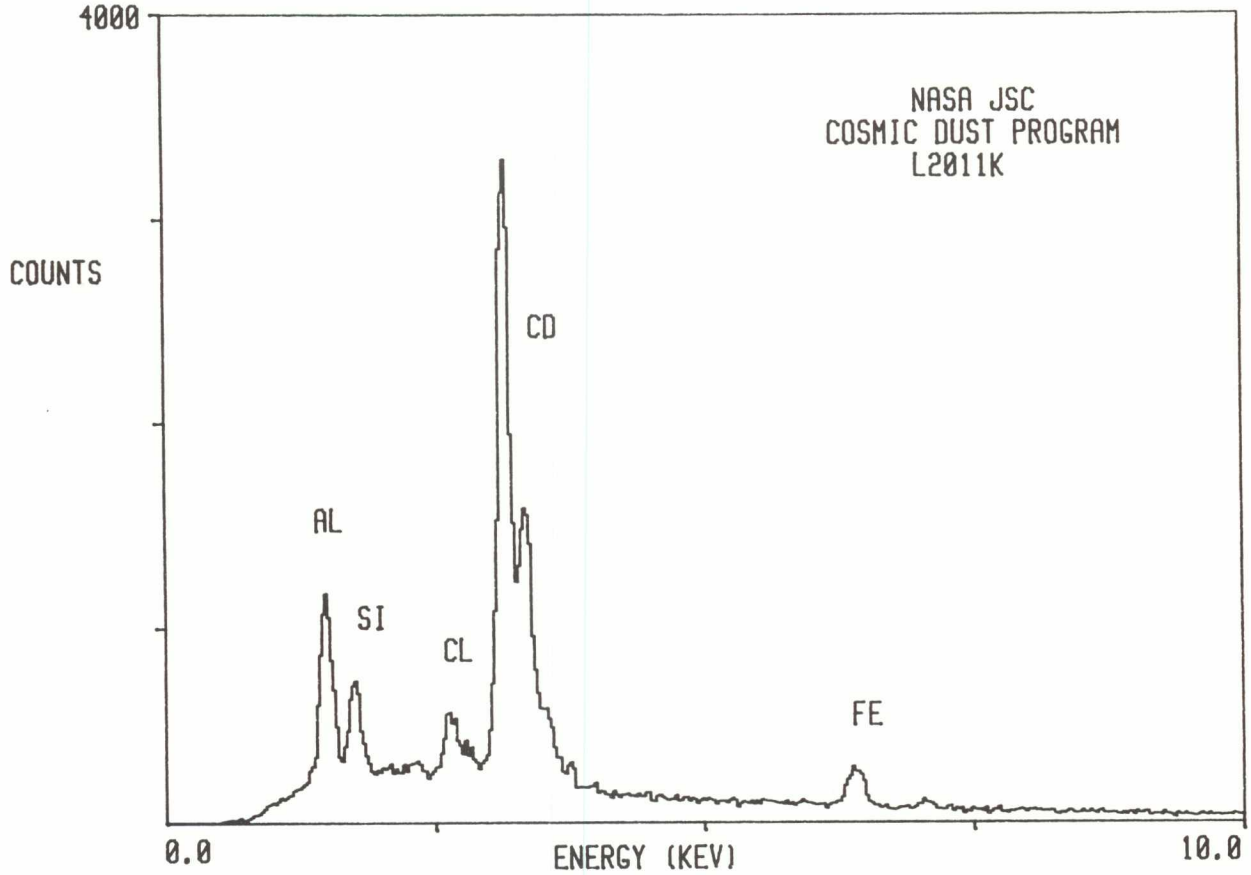
L2011 K 14



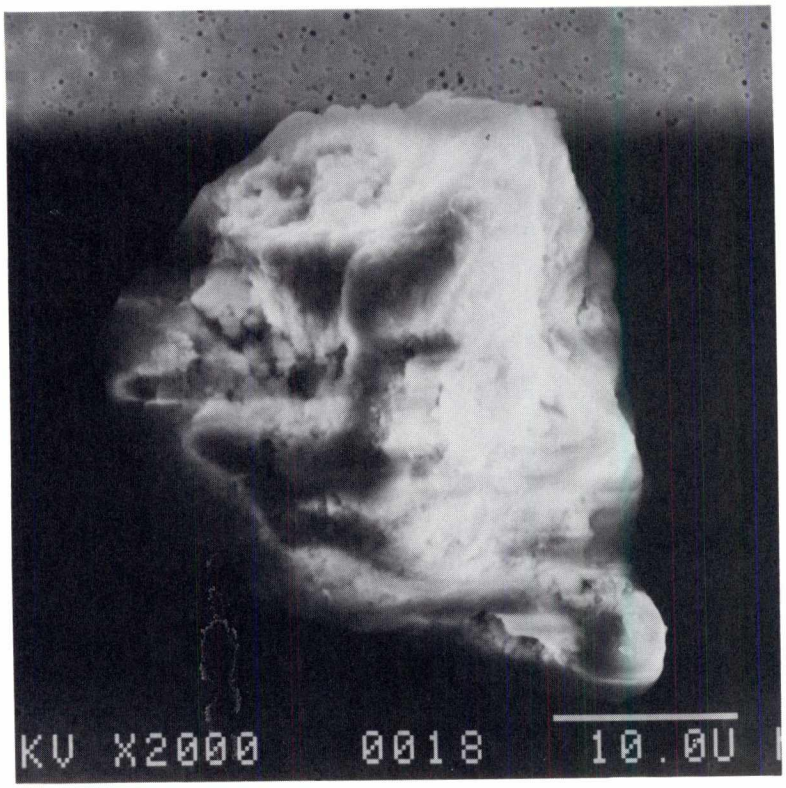
S-92-35796

SIZE: 24x20
SHAPE: E
TRANS.: TL
COLOR: Black
LUSTER: V
TYPE: TCA

COMMENTS:



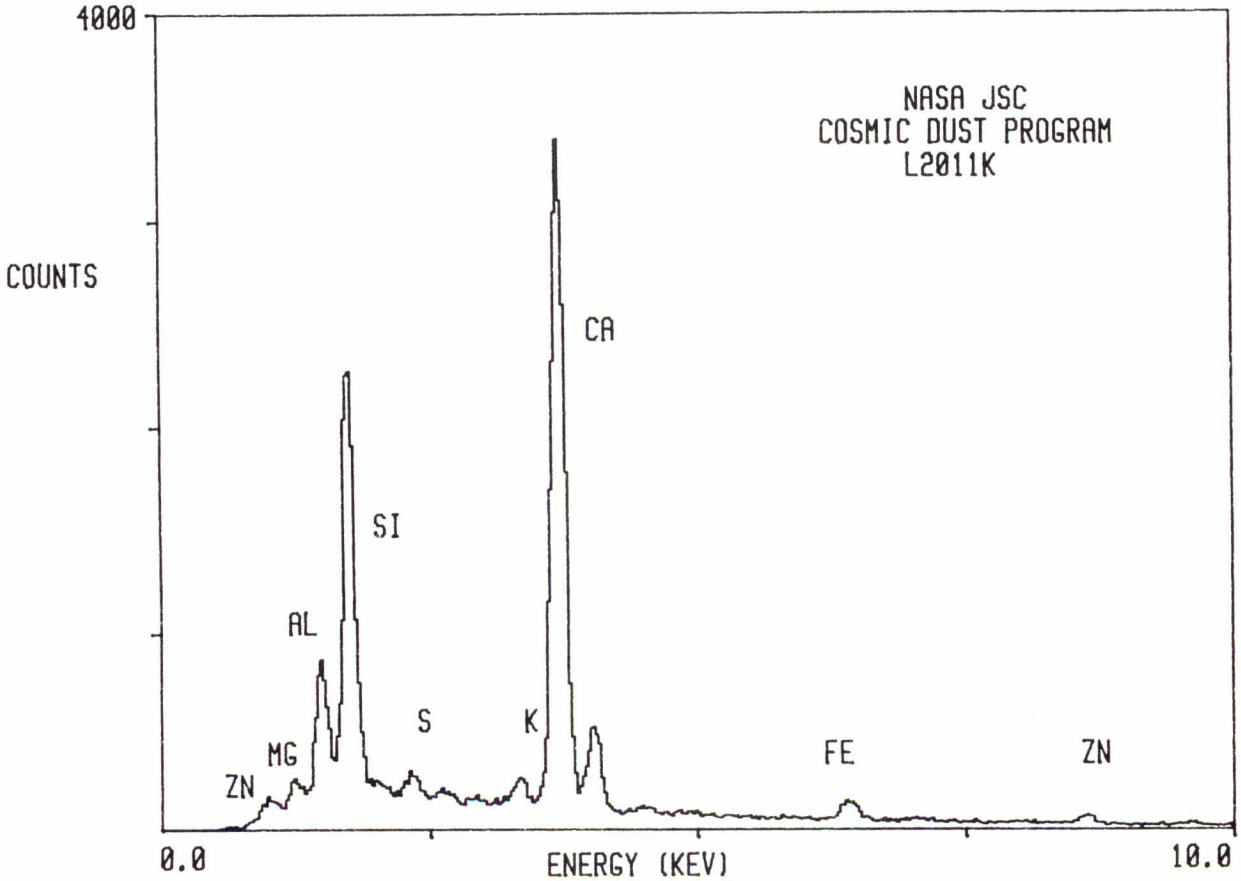
L2011 K 16



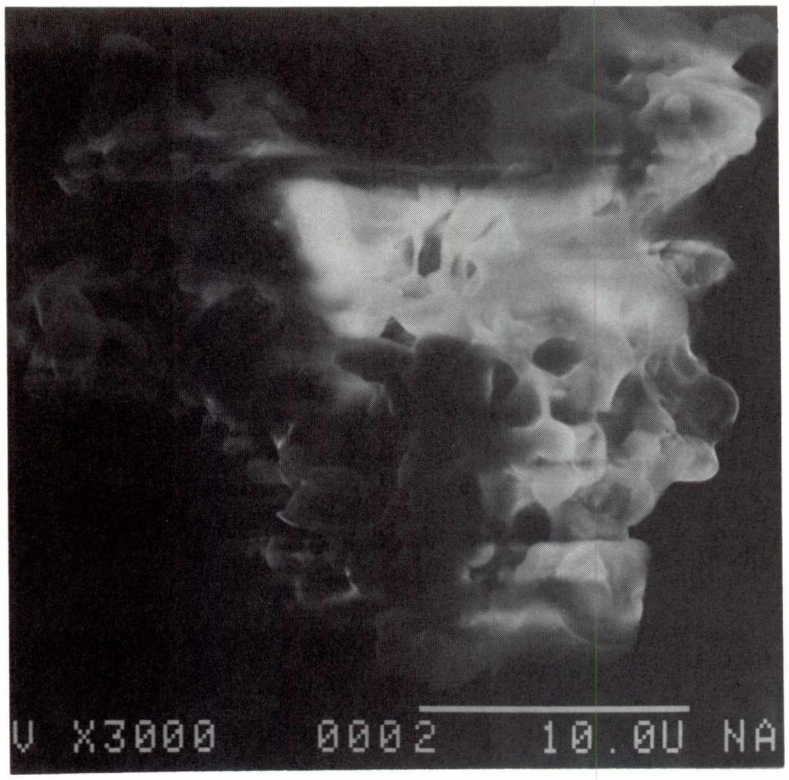
S-92-35798

SIZE: 35x30
SHAPE: I
TRANS.: O
COLOR: White
LUSTER: D
TYPE: TCA?

COMMENTS:



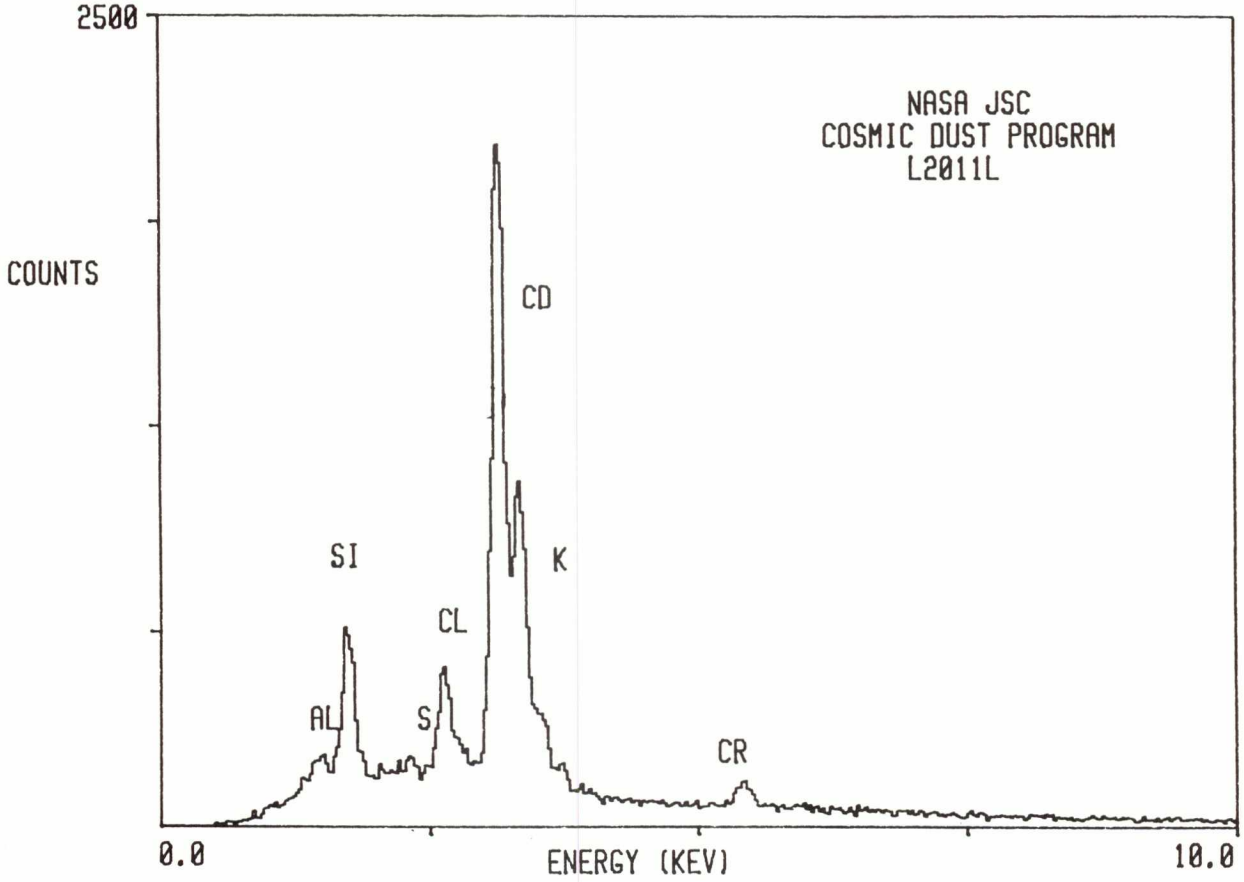
L2011 L 1



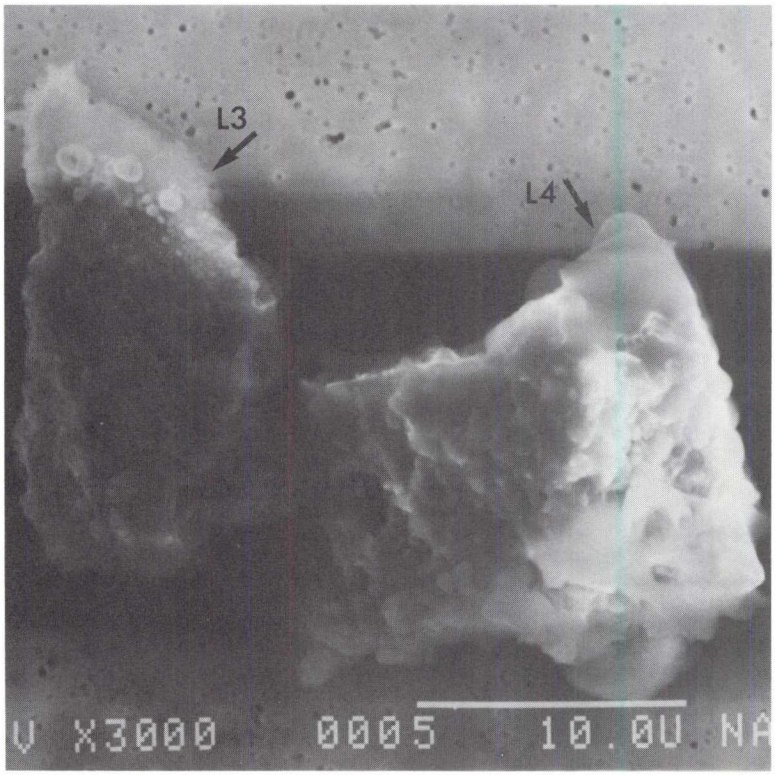
S-92-35772

SIZE: 42x38
SHAPE: I
TRANS.: TL
COLOR: Black
LUSTER: V
TYPE: TCA

COMMENTS:



L2011 L 3



S-92-35774

SIZE: 20x10

SHAPE: E

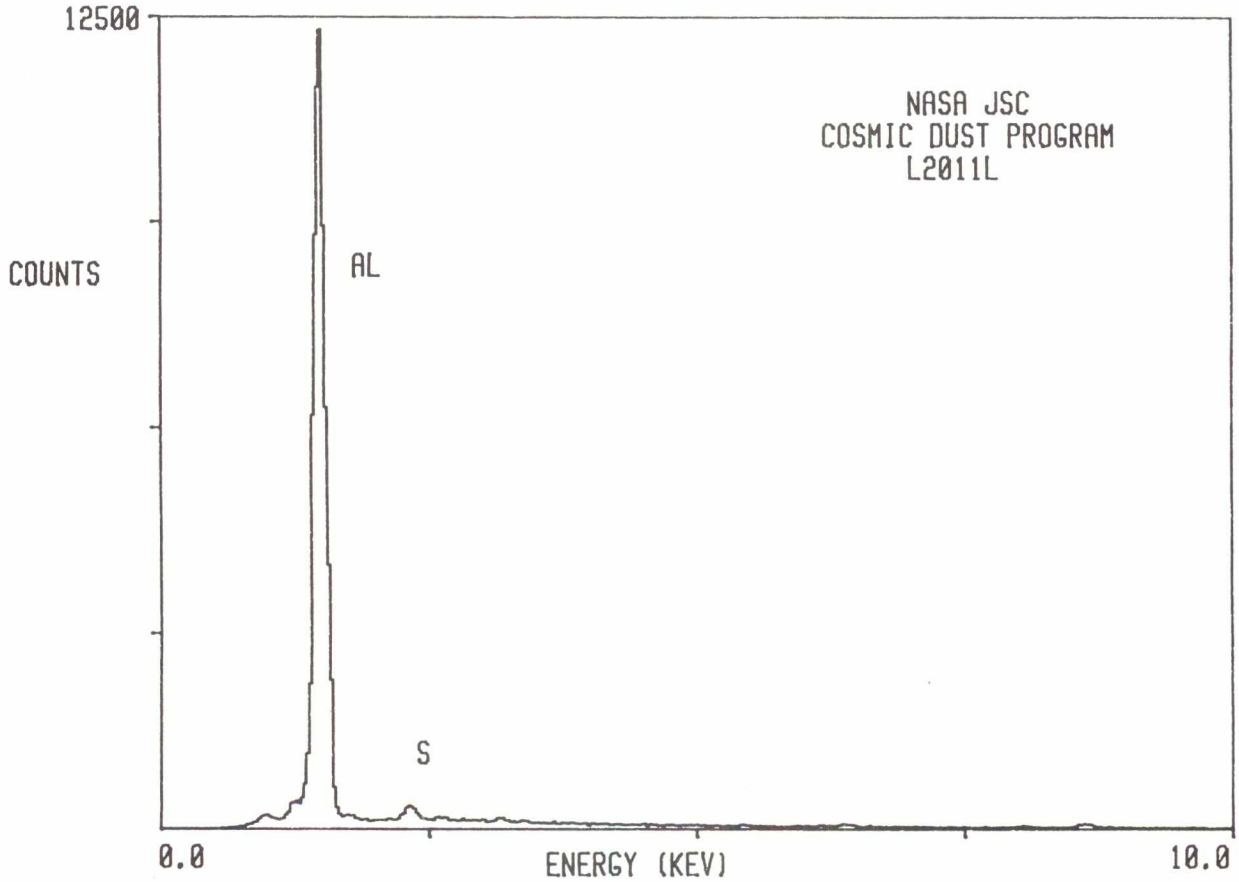
TRANS.: O

COLOR: Black

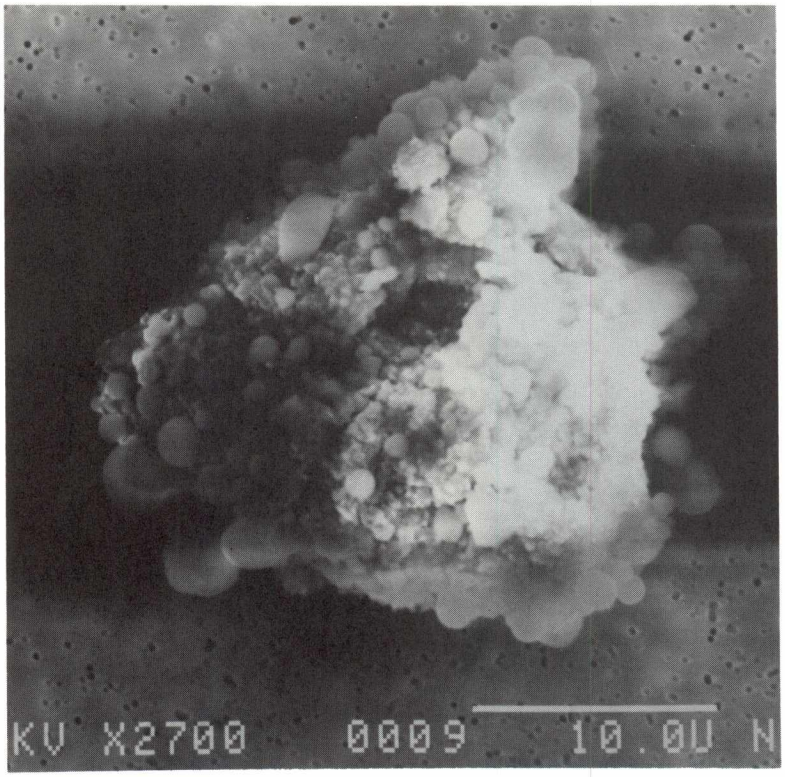
LUSTER: M

TYPE: TCA

COMMENTS:
Attached to L2011 L4?



L2011 L 5



S-92-35776

SIZE: 30x24

SHAPE: E/I

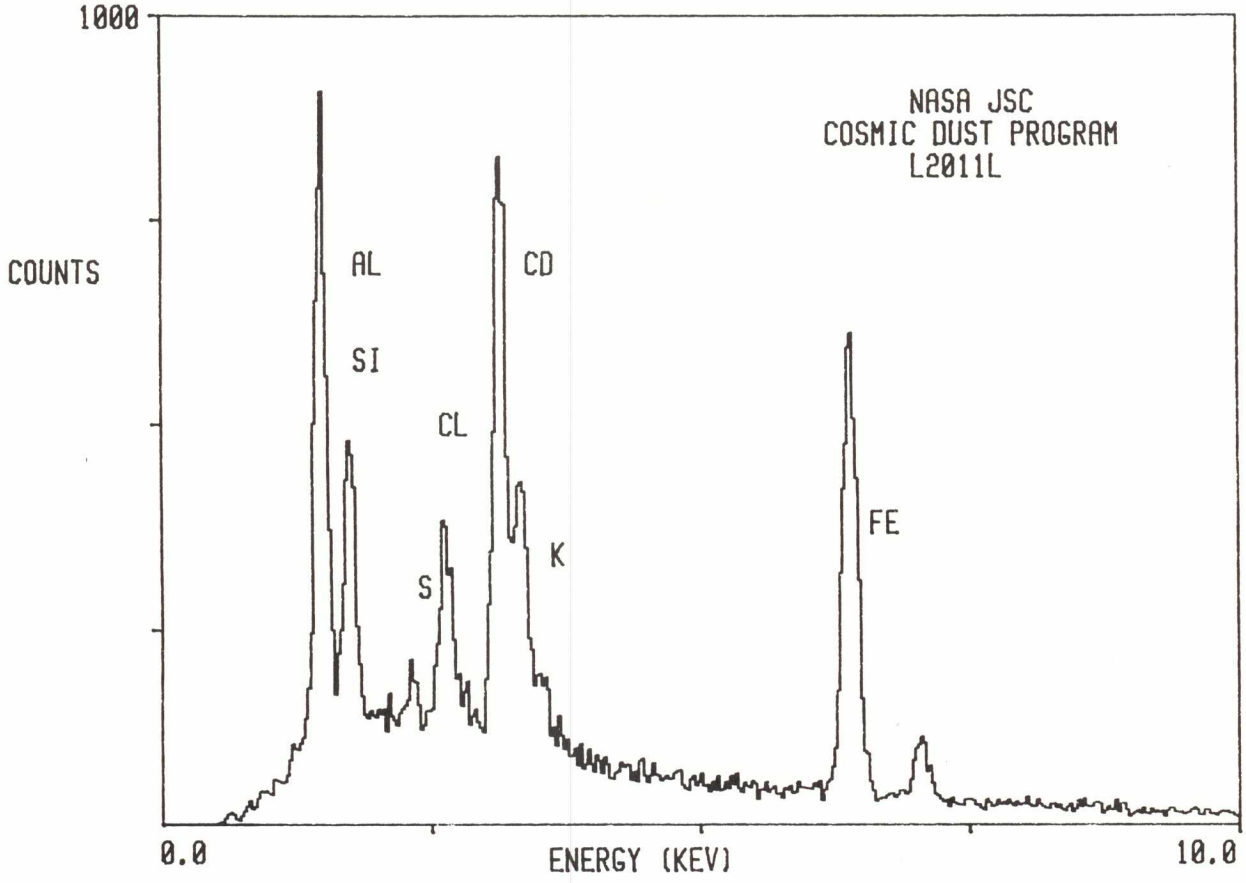
TRANS.: TL

COLOR: Colorless to Black

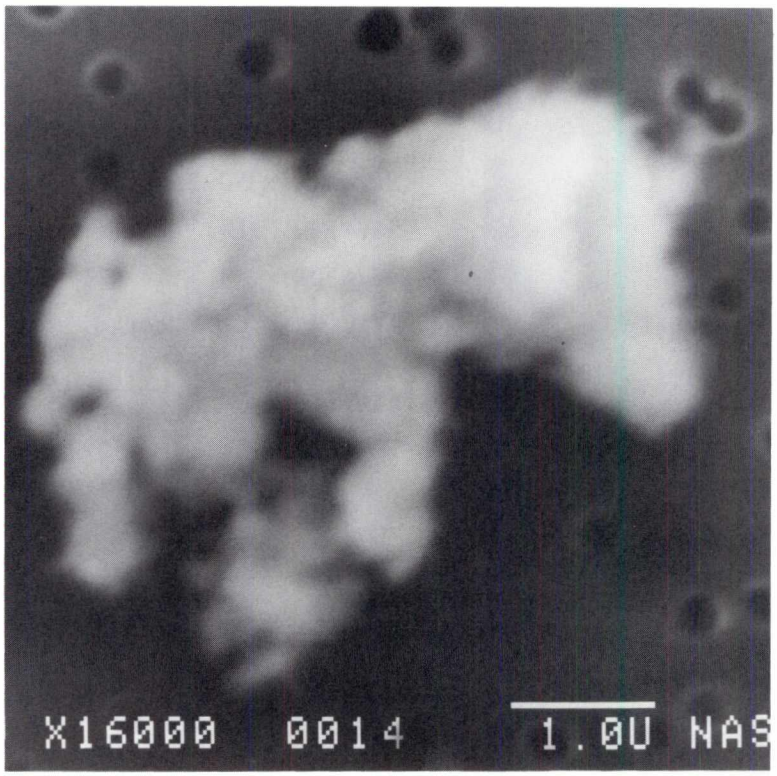
LUSTER: V

TYPE: TCA

COMMENTS:



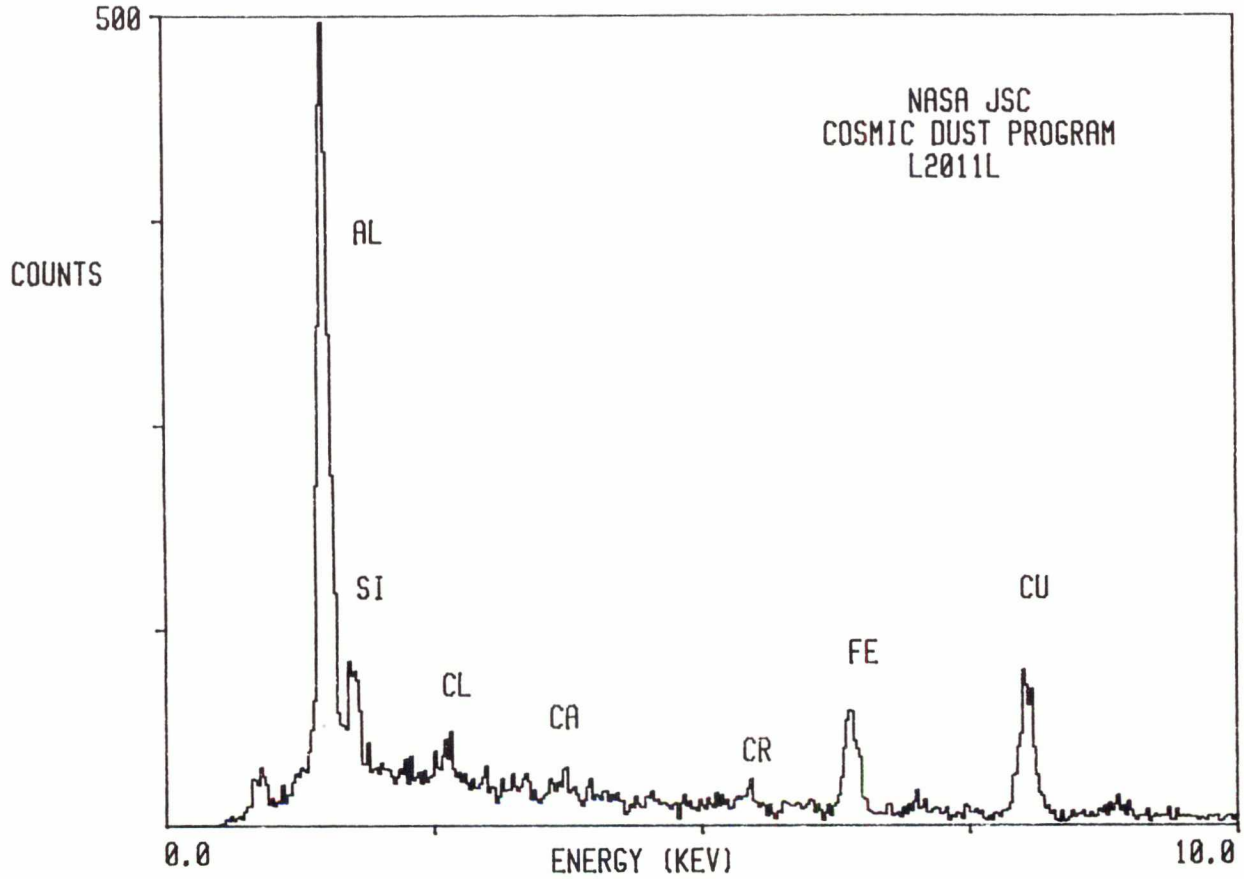
L2011 L 7



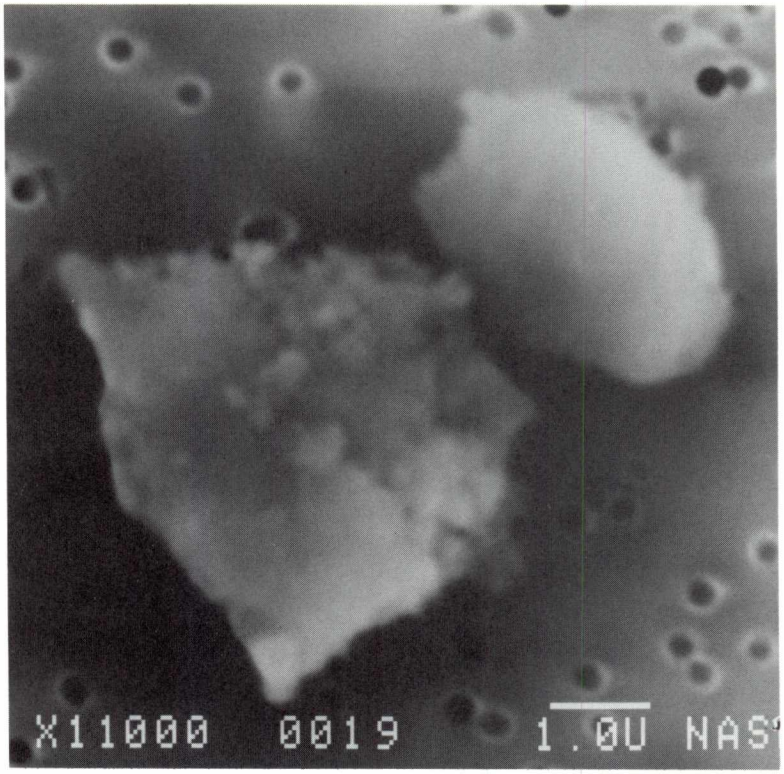
S-92-35778

SIZE: 5x4
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



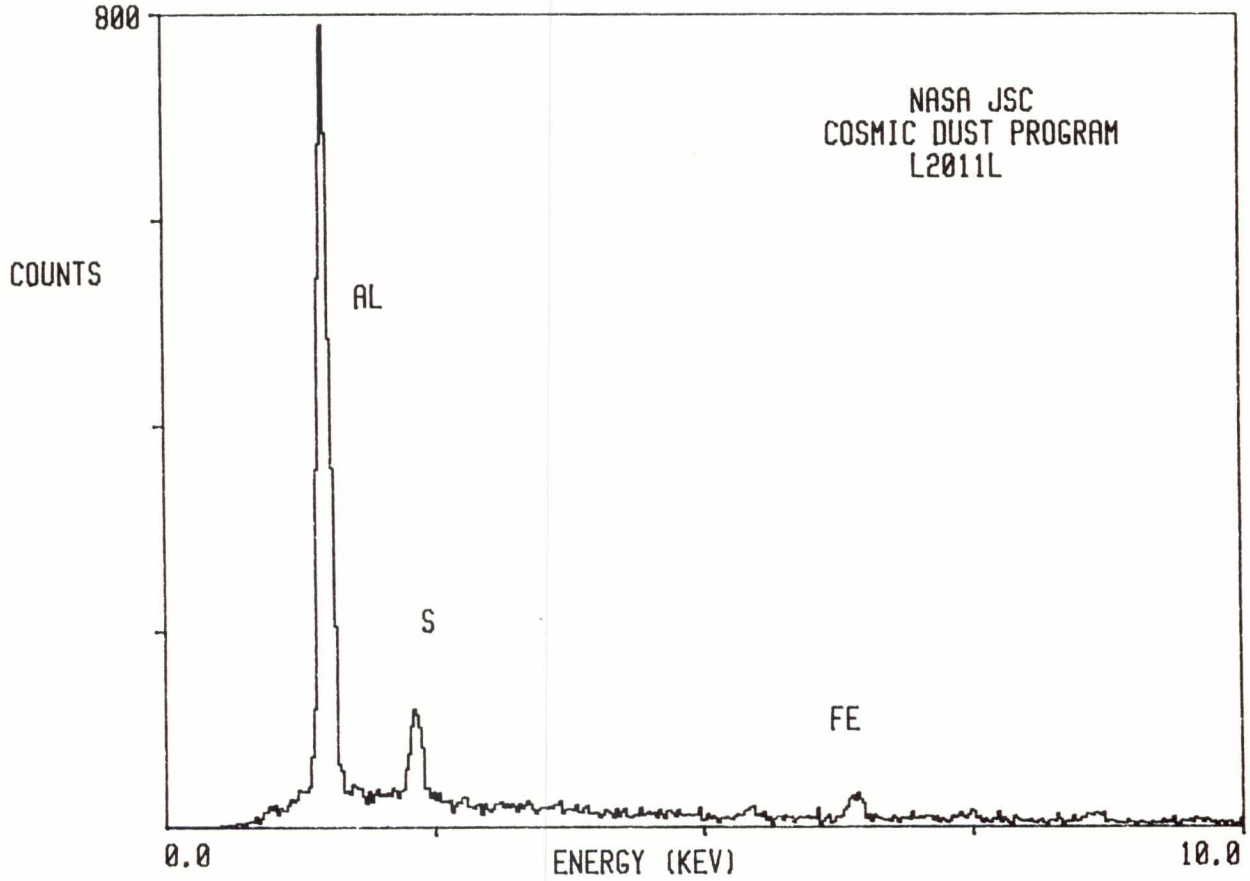
L2011 L 9



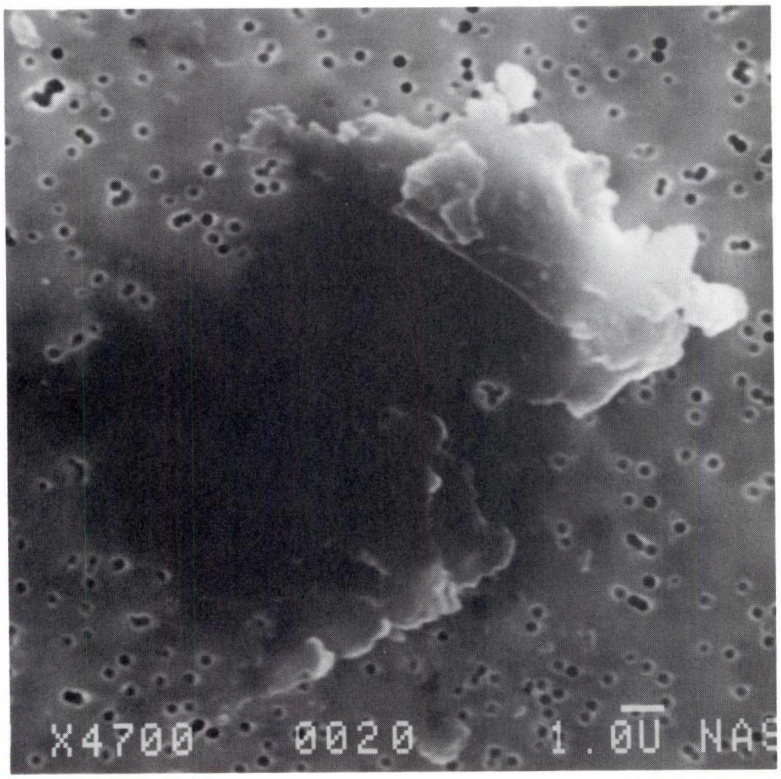
S-92-35780

SIZE: 65x45
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



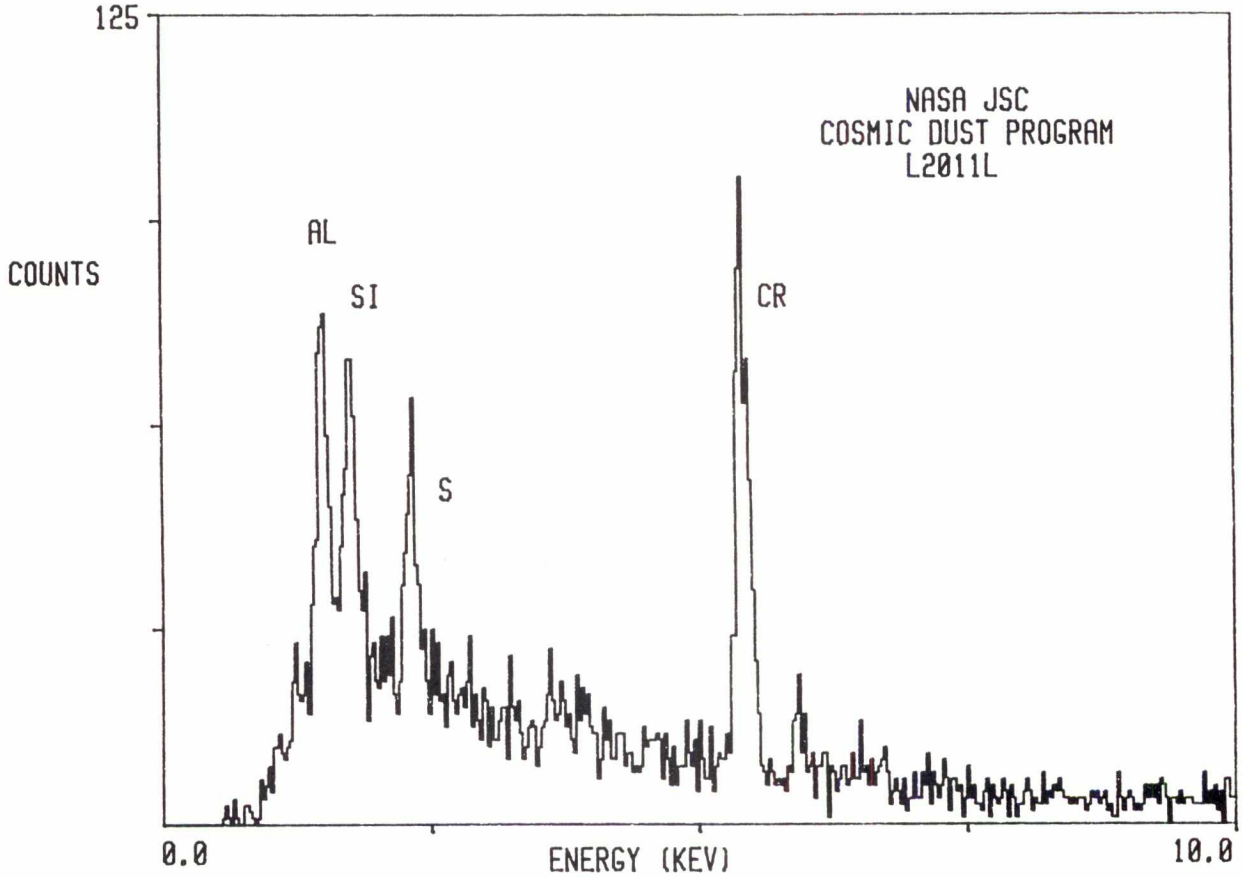
L2011 L 10



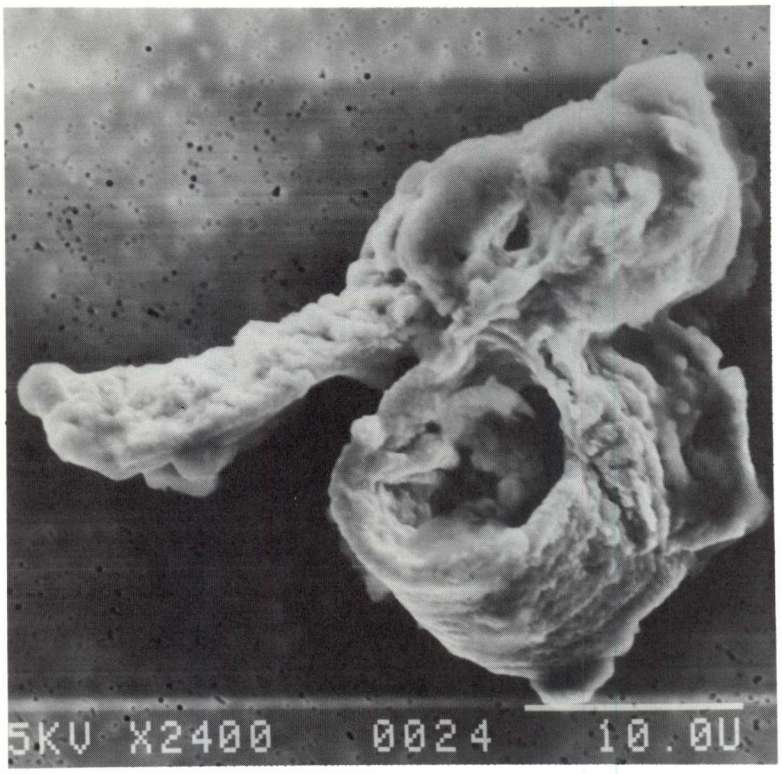
S-92-35781

SIZE: 35x20
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCA

COMMENTS:



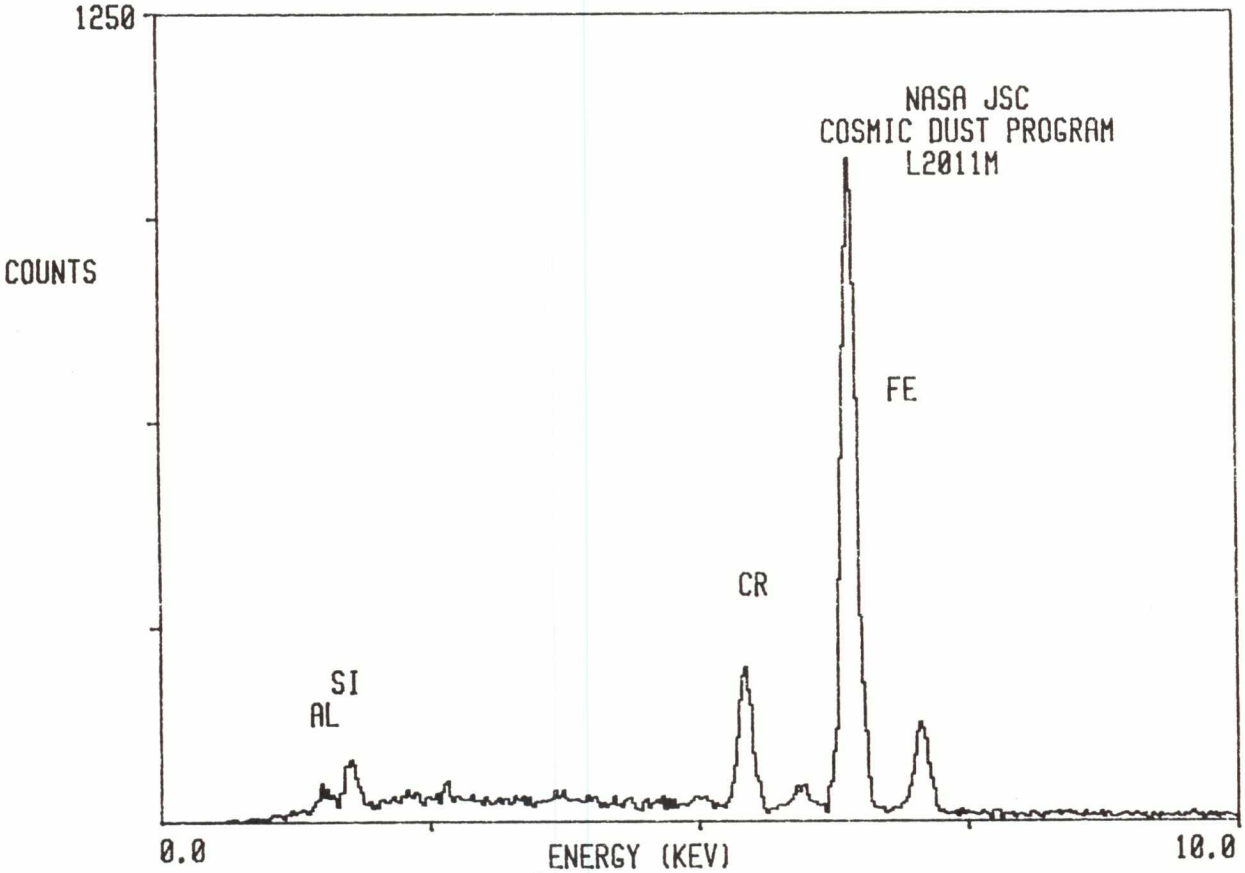
L2011 M 1



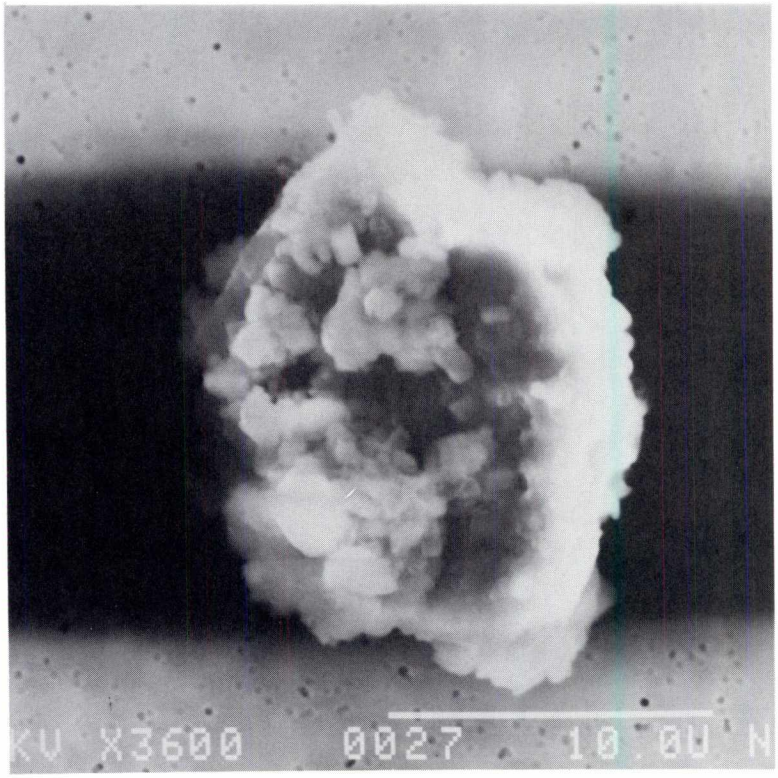
S-92-35398

SIZE: 35x33
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: TCA?

COMMENTS:



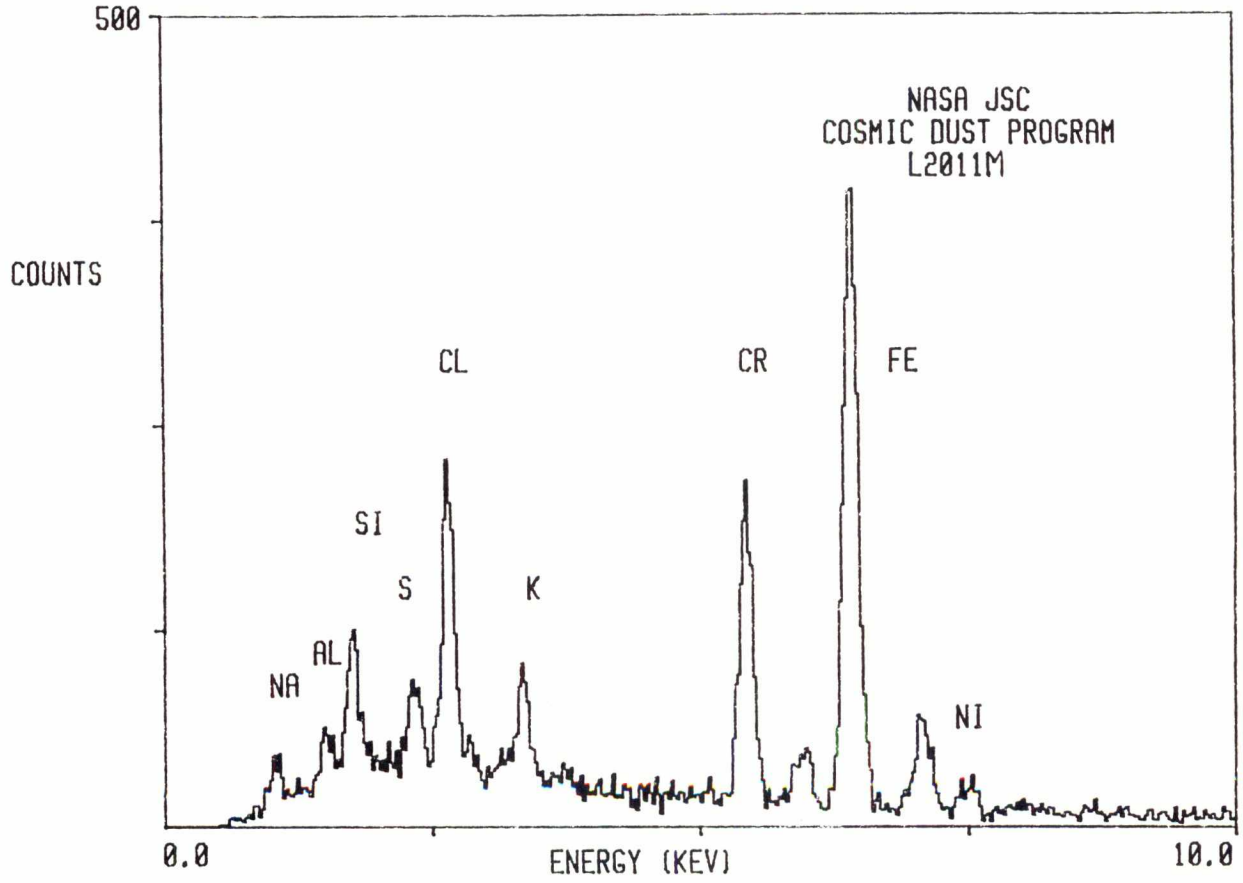
L2011 M 2



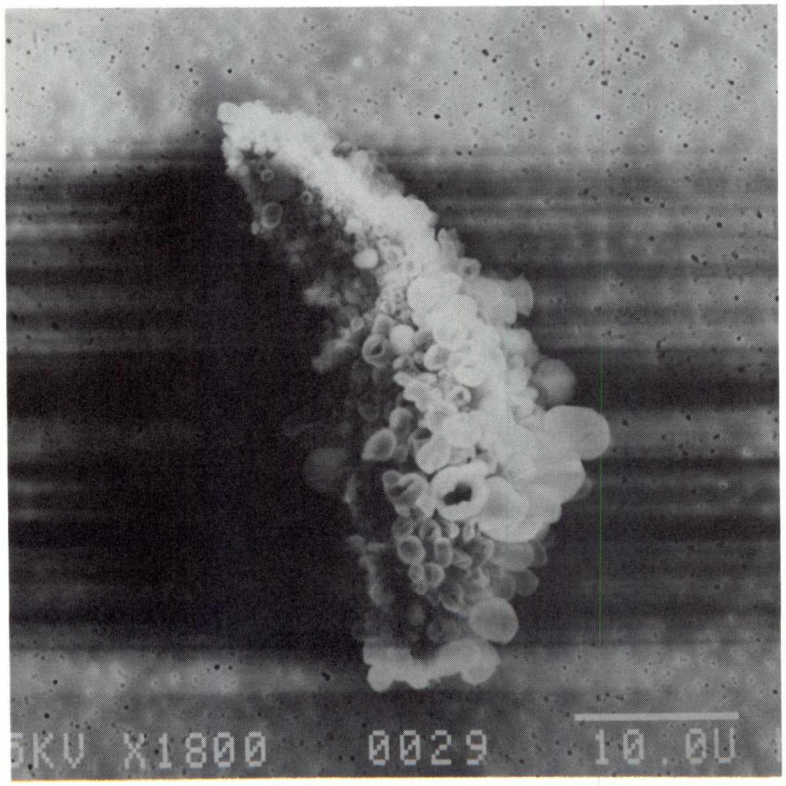
S-92-35399

SIZE: 19x15
SHAPE: E
TRANS.: O
COLOR: Brown
LUSTER: M
TYPE: TCA?

COMMENTS:



L2011 M 3



S-92-35400

SIZE: 37x19

SHAPE: I

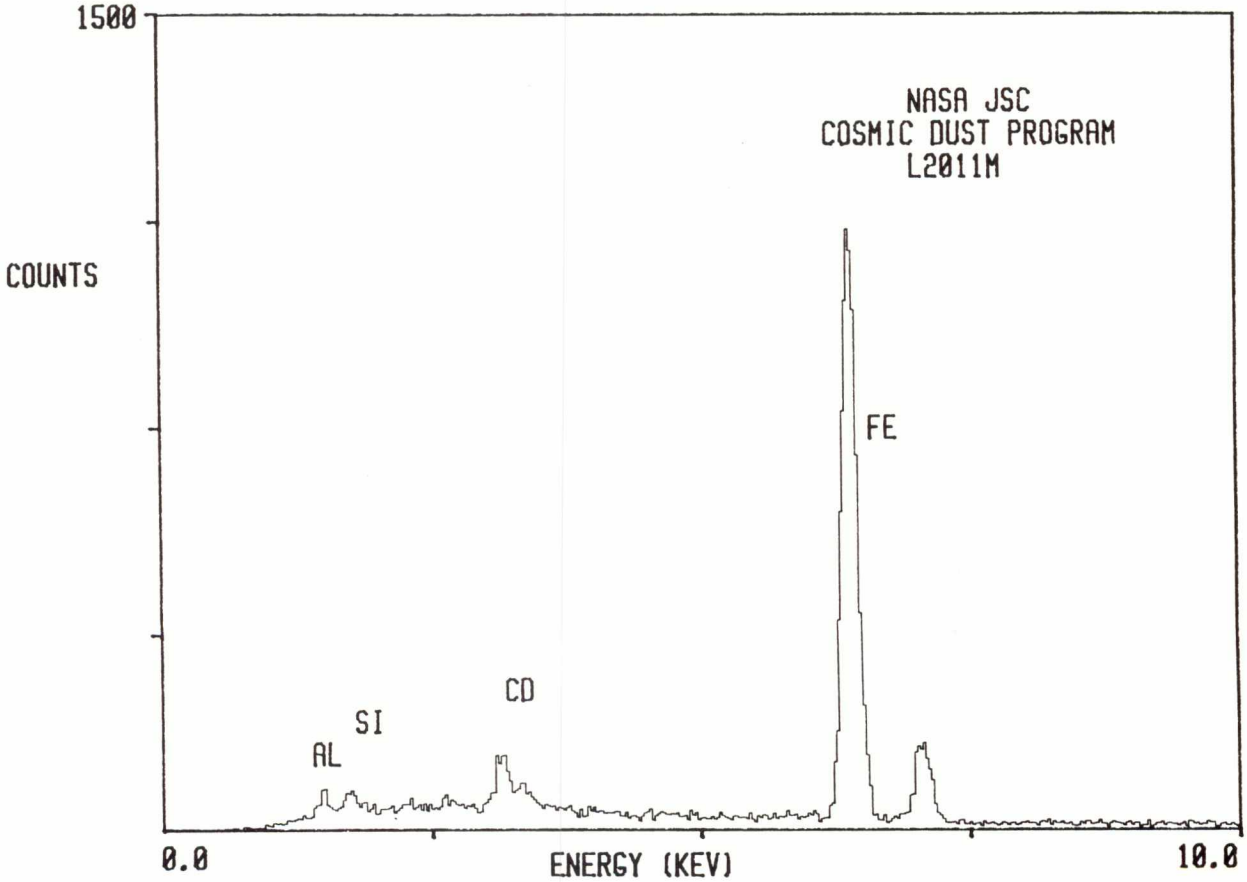
TRANS.: O

COLOR: Brown to Black

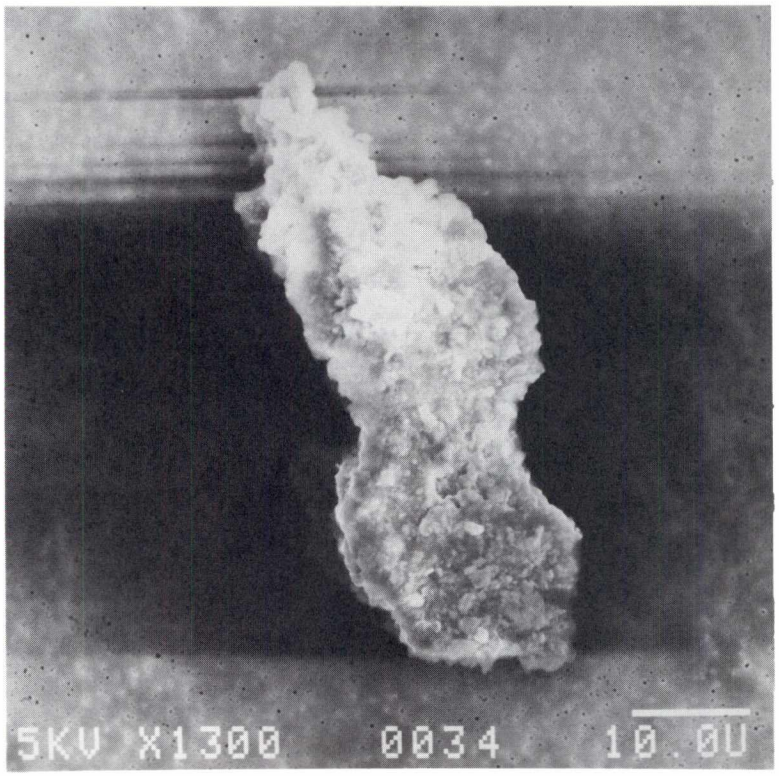
LUSTER: SM

TYPE: TCA

COMMENTS:



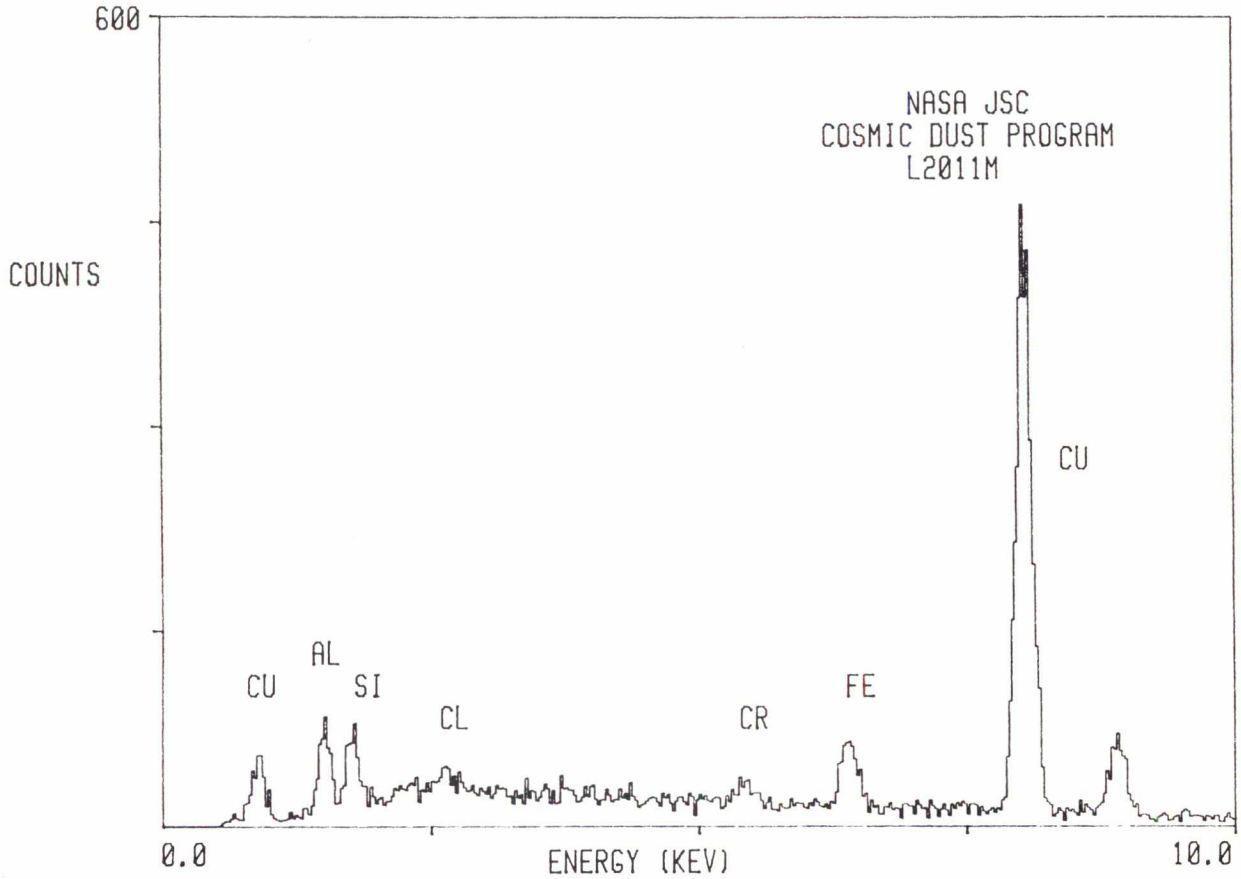
L2011 M 6



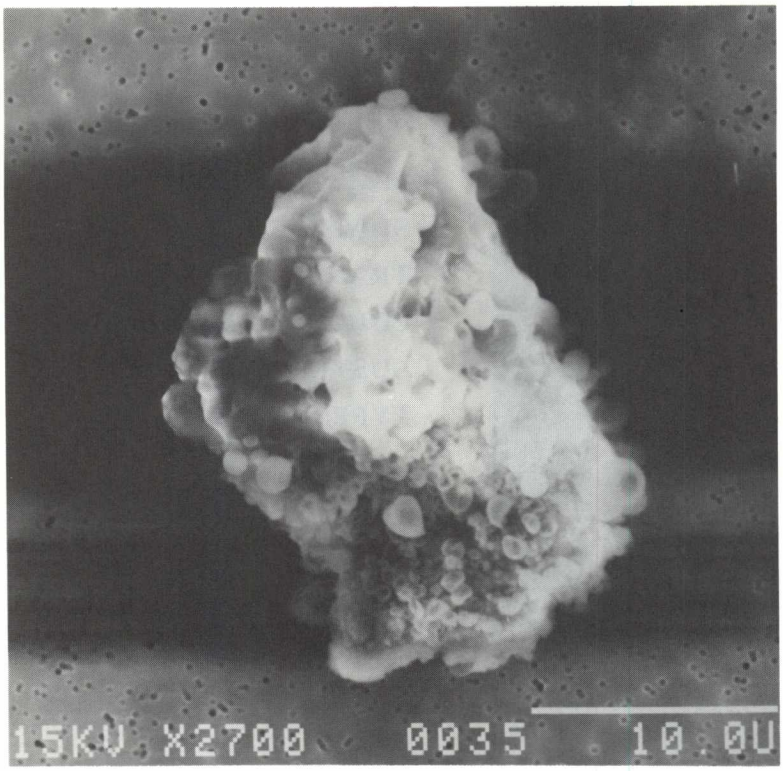
S-92-35403

SIZE: 55x22
SHAPE: I
TRANS.: O
COLOR: Brown to Black
LUSTER: M
TYPE: TCA

COMMENTS:



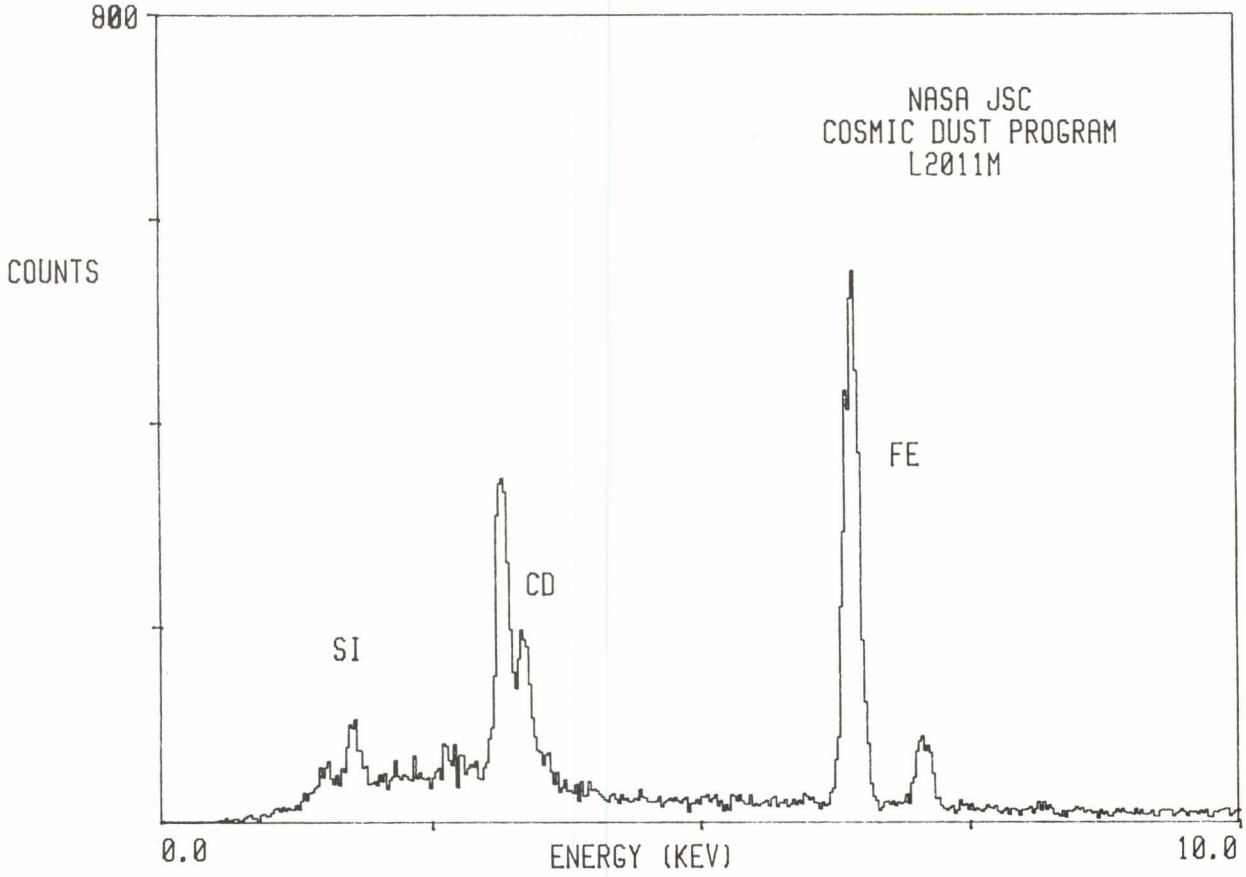
L2011 M 7



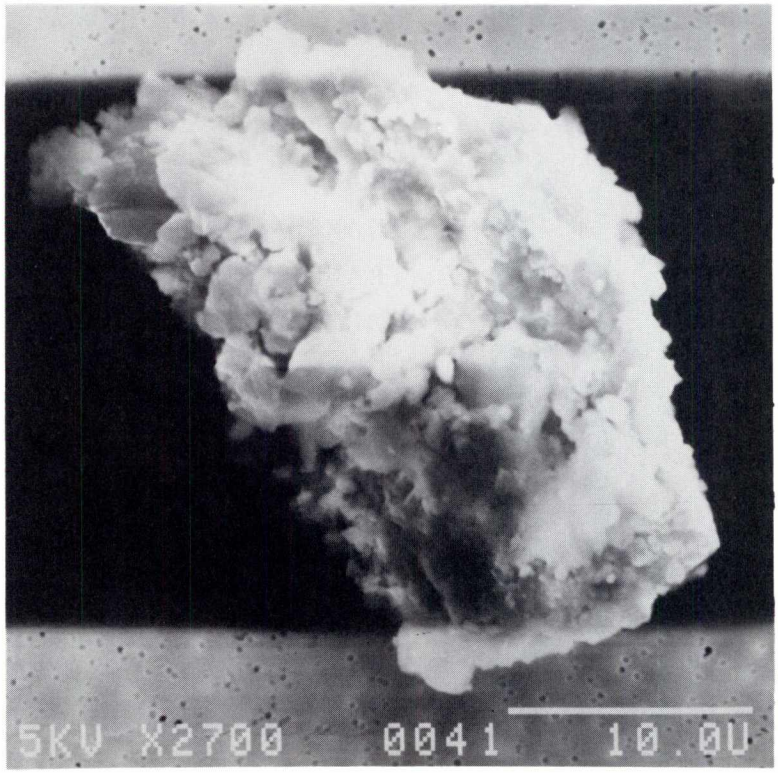
S-92-35404

SIZE: 24x17
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: TCA

COMMENTS:



L2011 M 11



S-92-35408

SIZE: 26x18

SHAPE: I

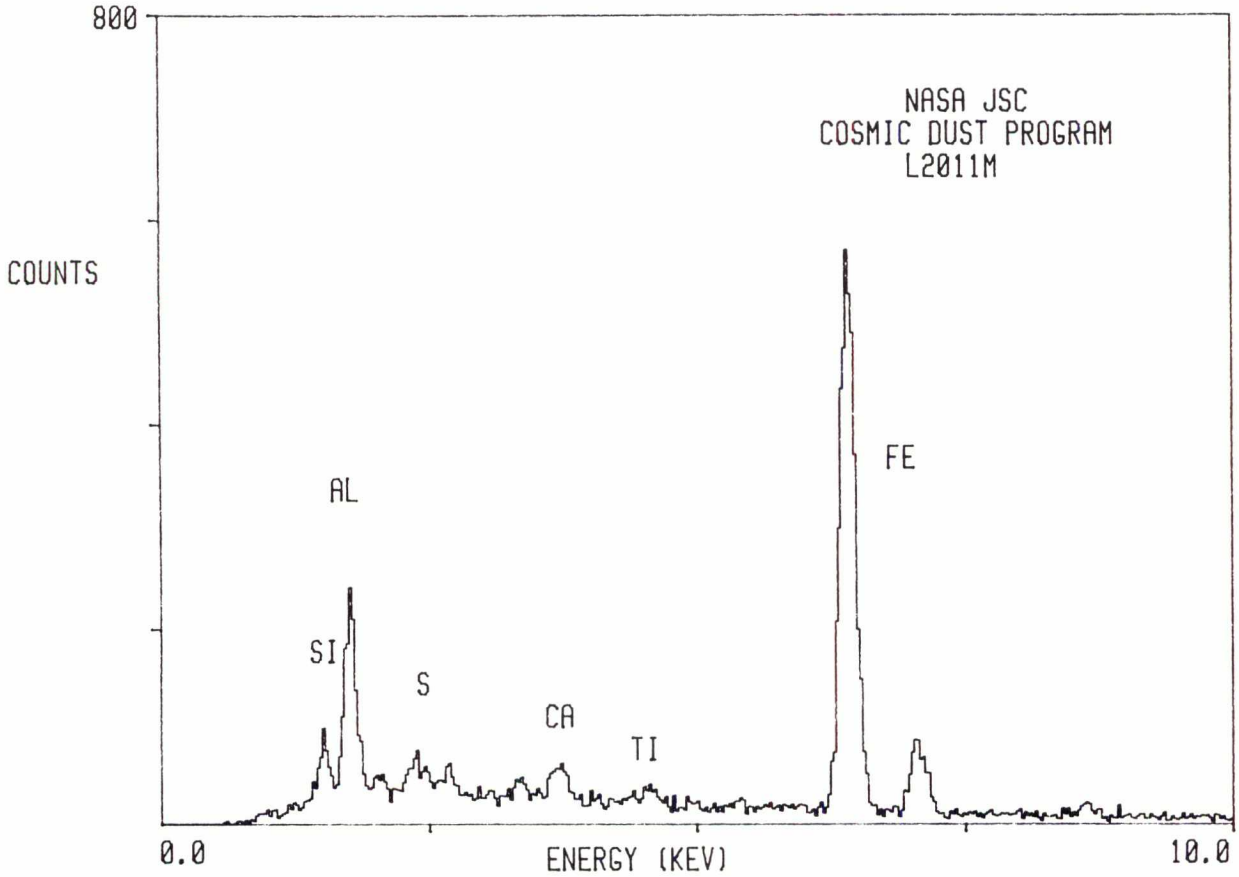
TRANS.: O

COLOR: Brown to Black

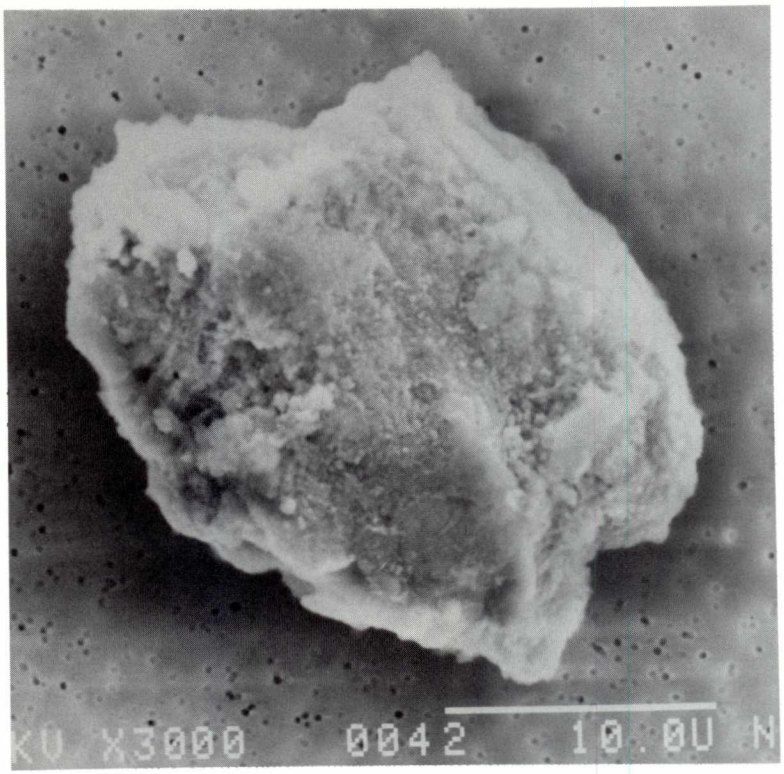
LUSTER: V

TYPE: TCA?

COMMENTS:



L2011 M 12



S-92-35409

SIZE: 26x19

SHAPE: E

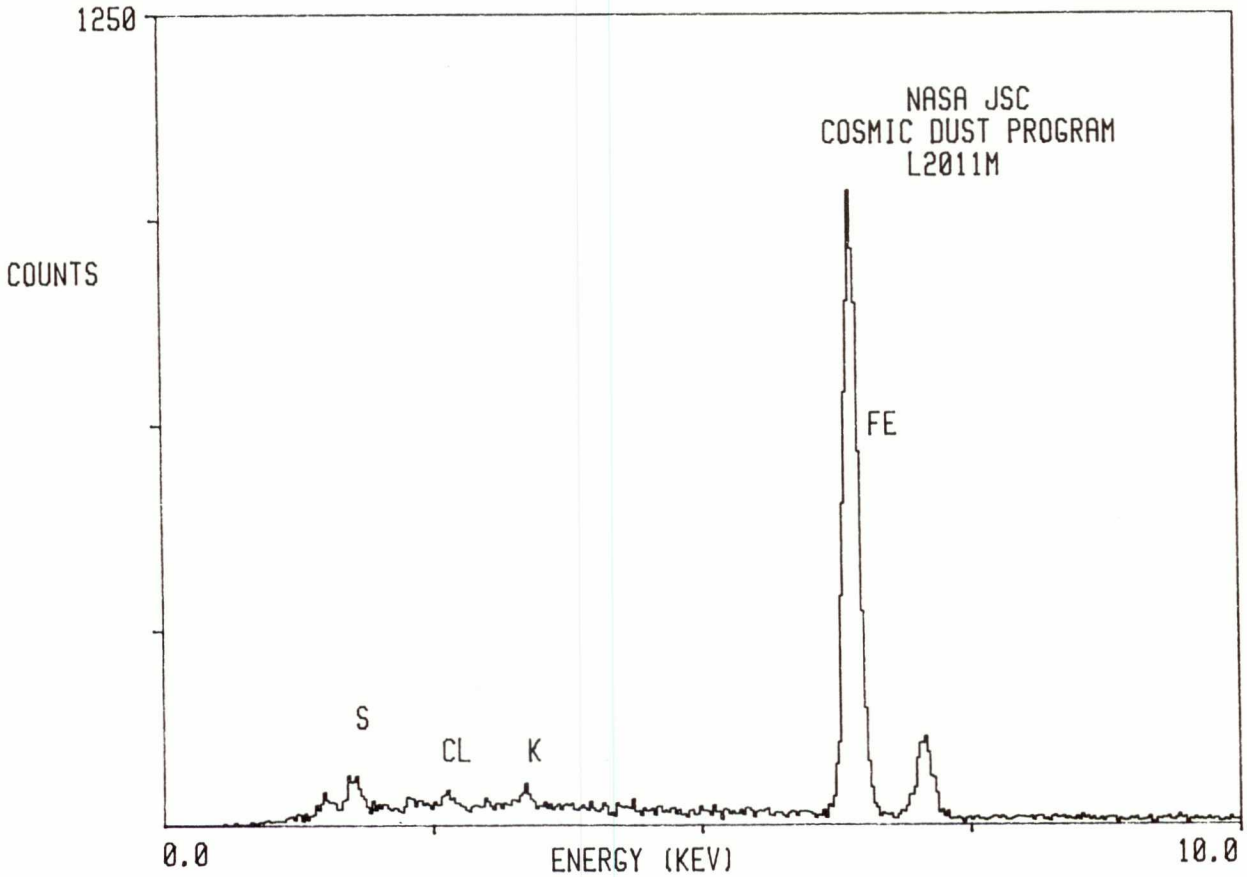
TRANS.: O

COLOR: Black

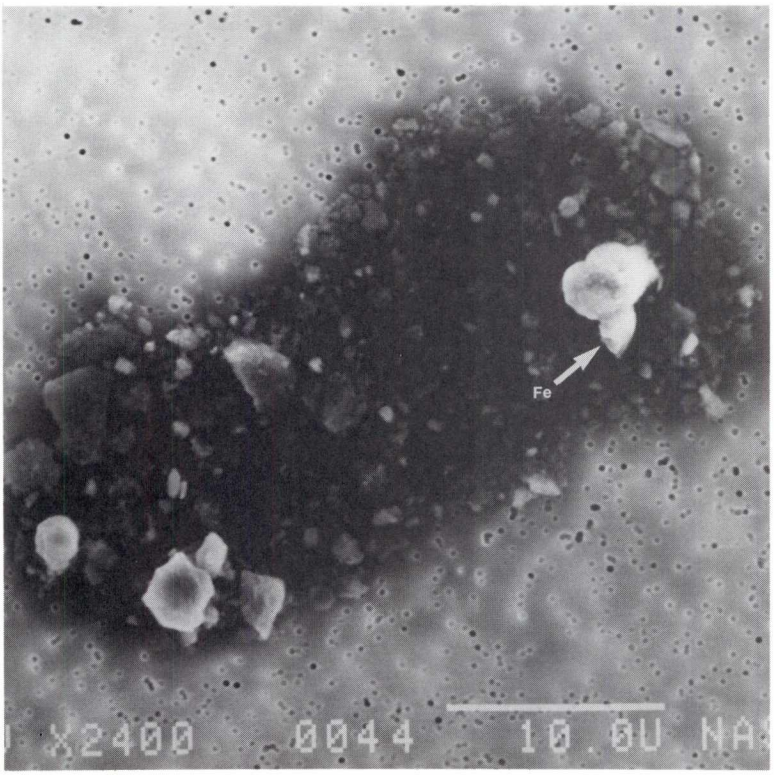
LUSTER: M

TYPE: TCA?

COMMENTS:



L2011 M 13



S-92-35410

SIZE: 10

SHAPE: I

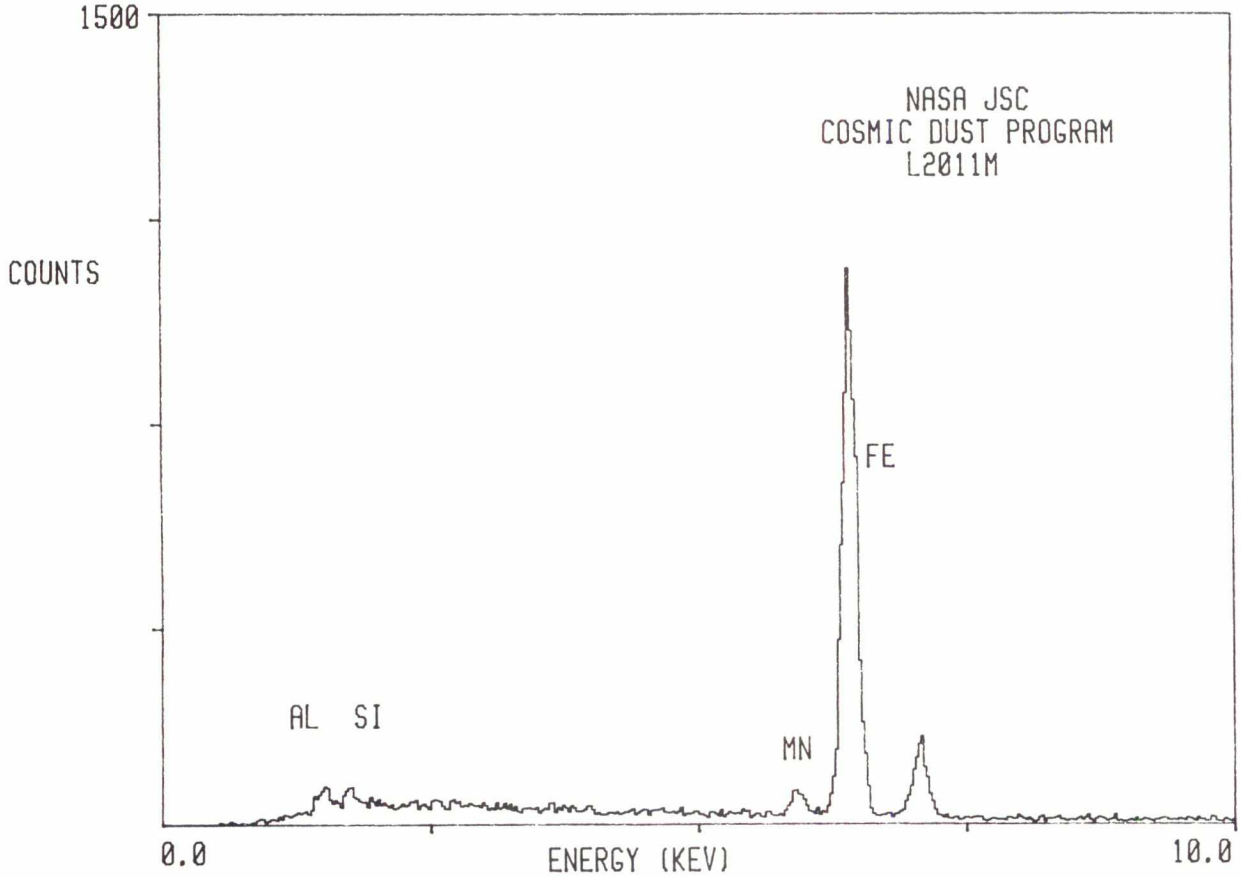
TRANS.: O

COLOR: Black

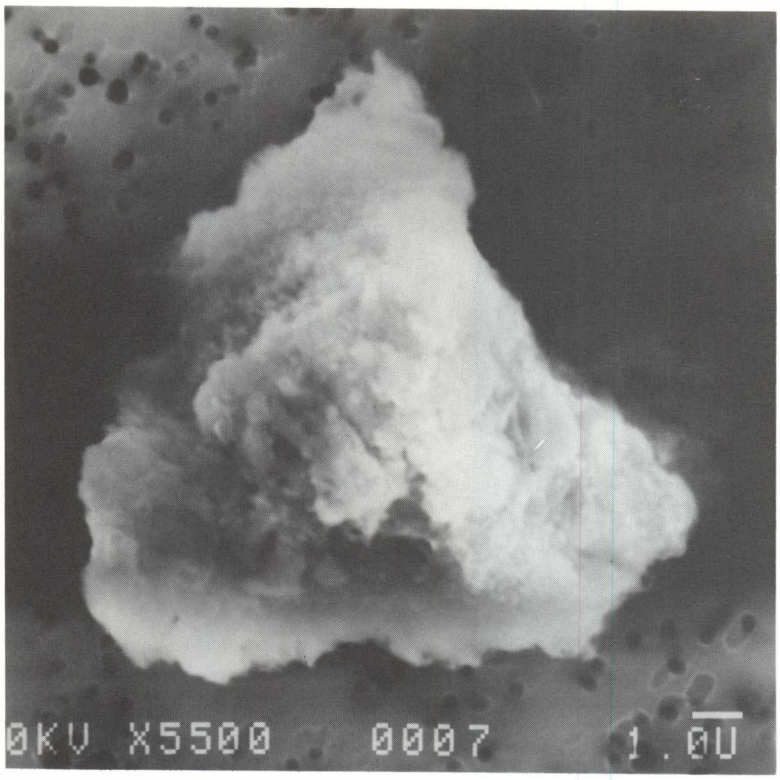
LUSTER: V

TYPE: TCA?

COMMENTS:
Largest grain is 10 microns



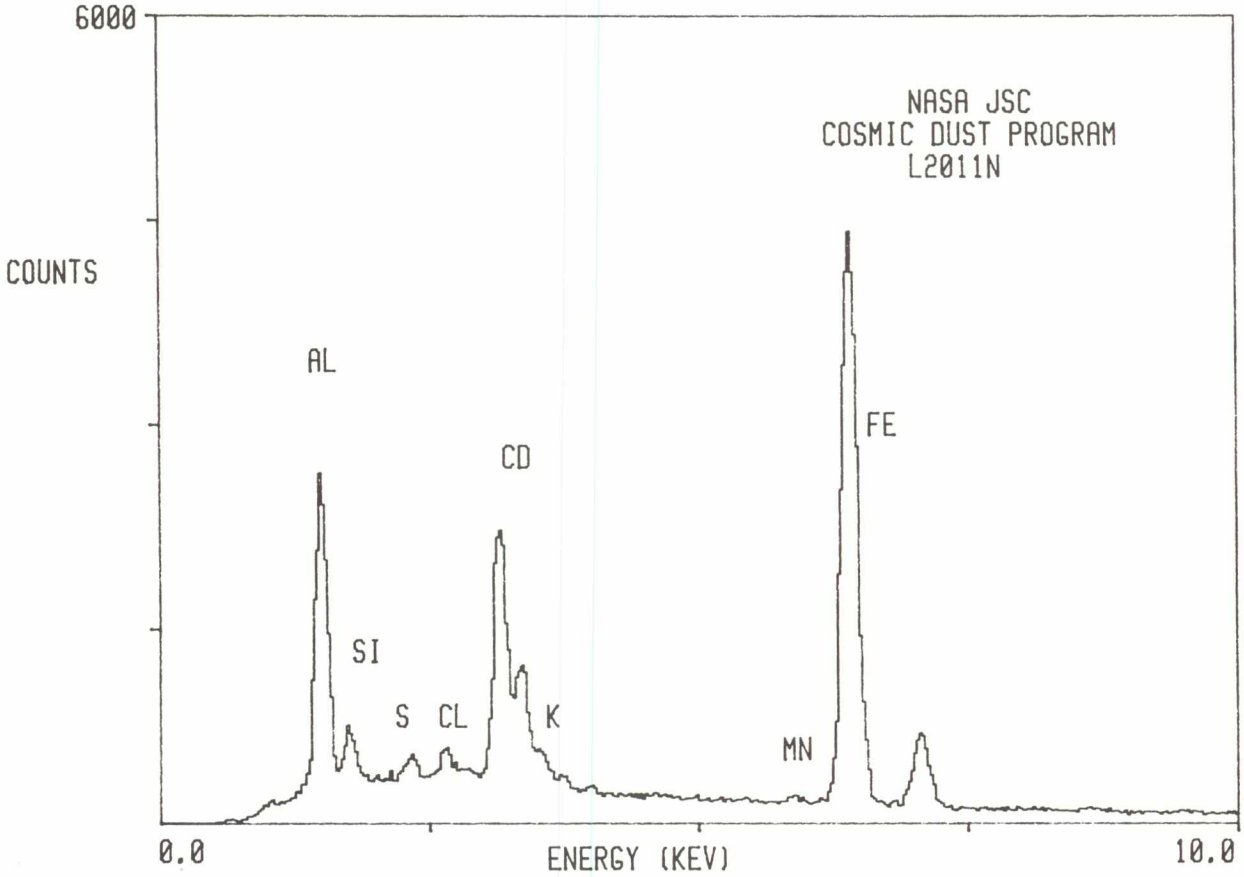
L2011 N 5



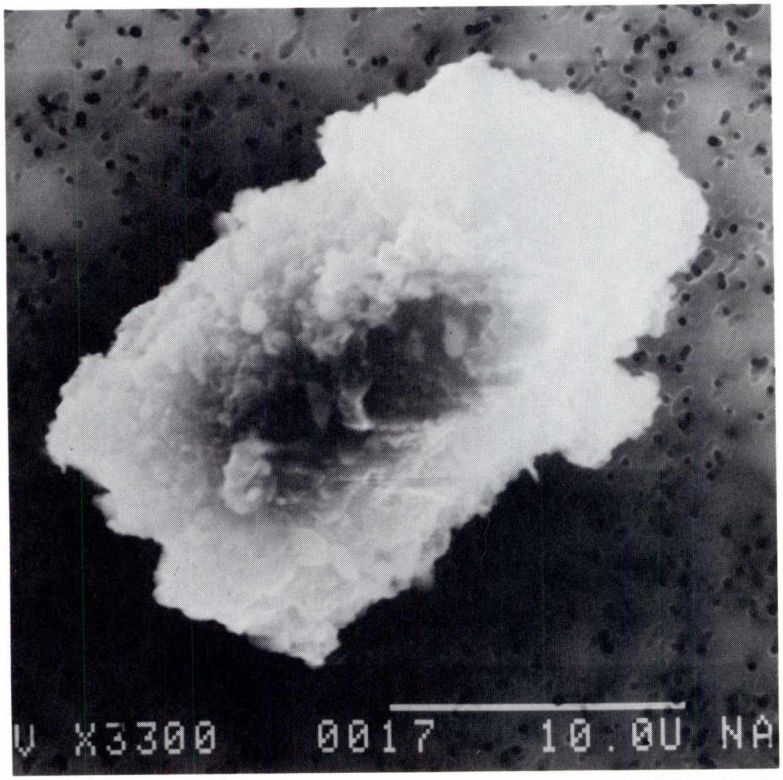
S-92-35352

SIZE: 13x11
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: TCA

COMMENTS:



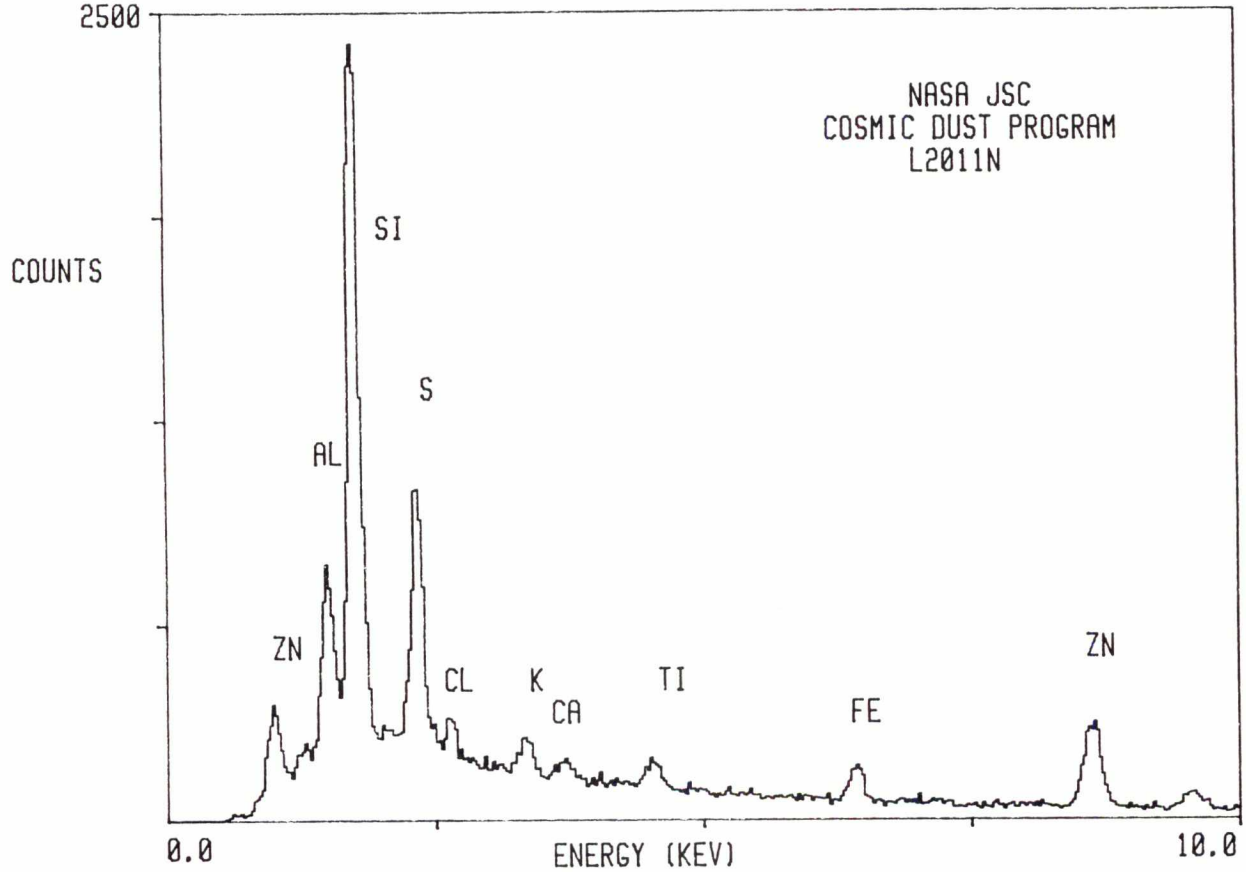
L2011 N 15



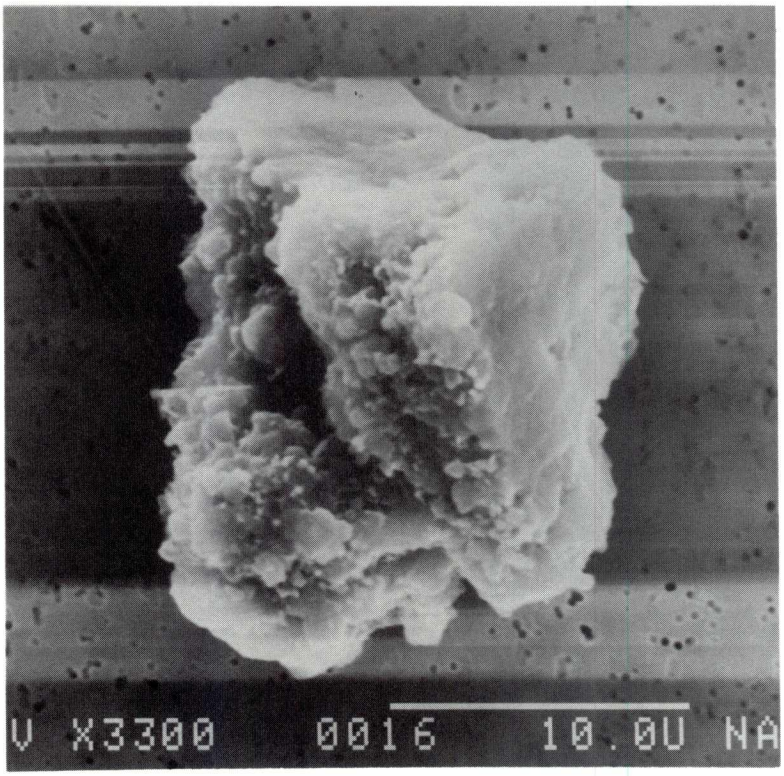
S-92-35362

SIZE: 24x15
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



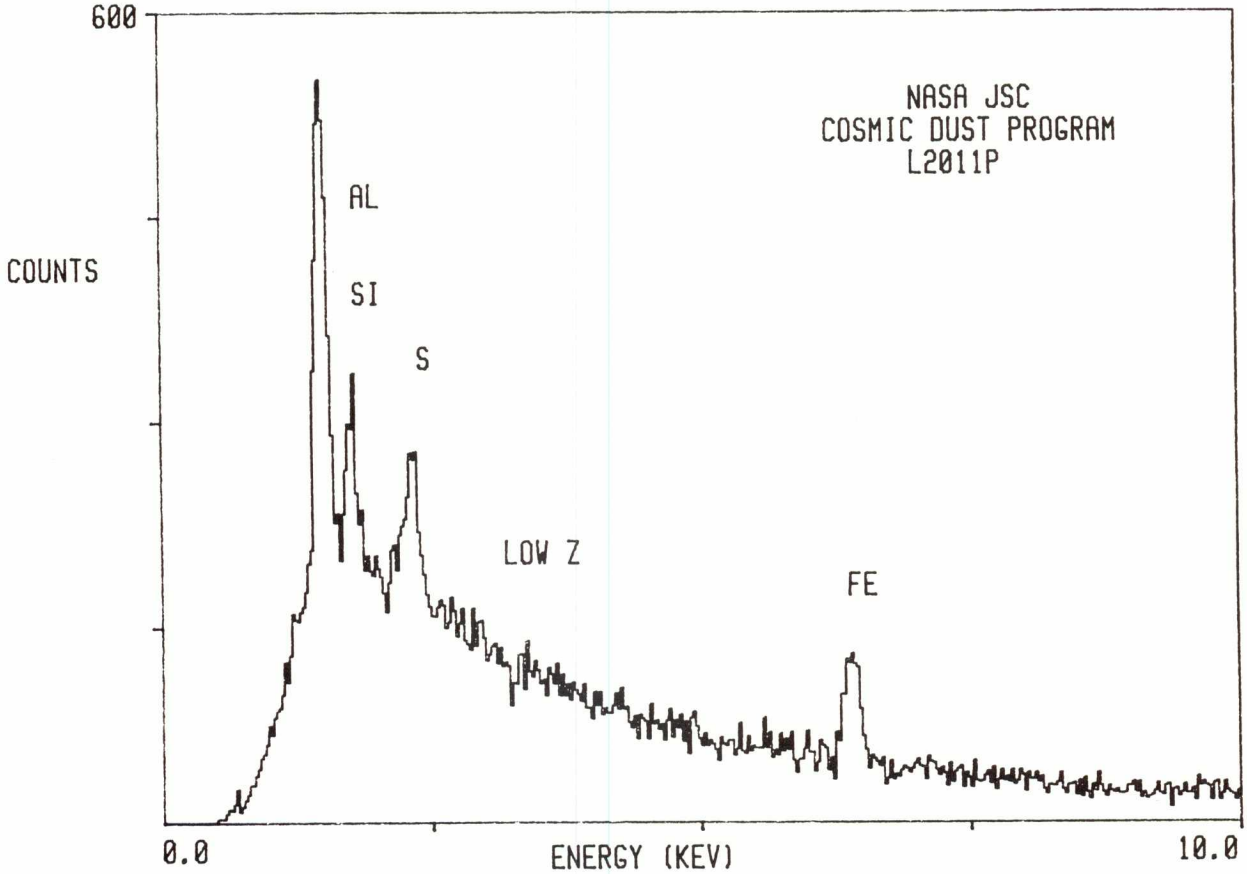
L2011 P 9



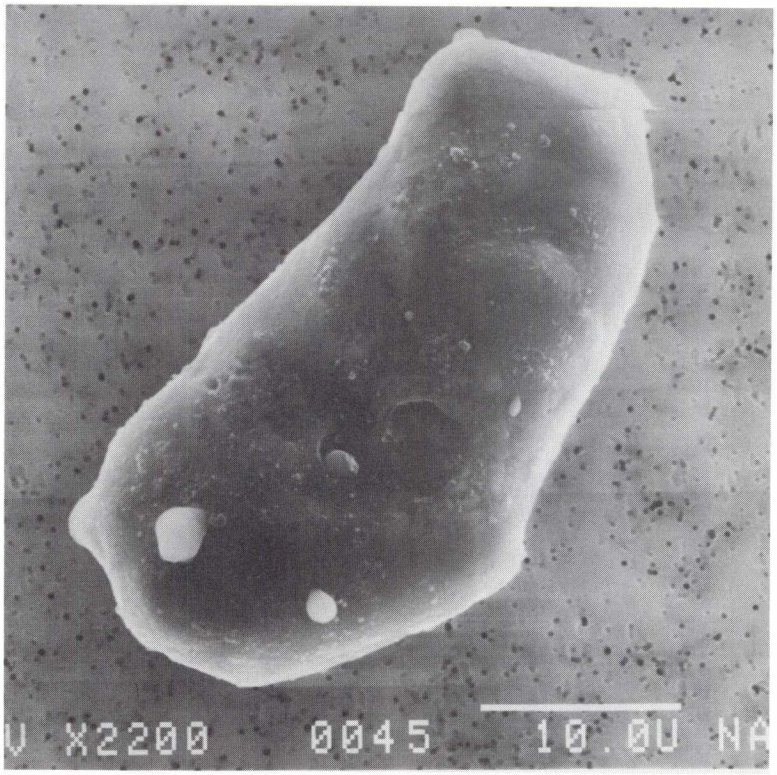
S-92-35270

SIZE: 19x15
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: TCA?

COMMENTS:



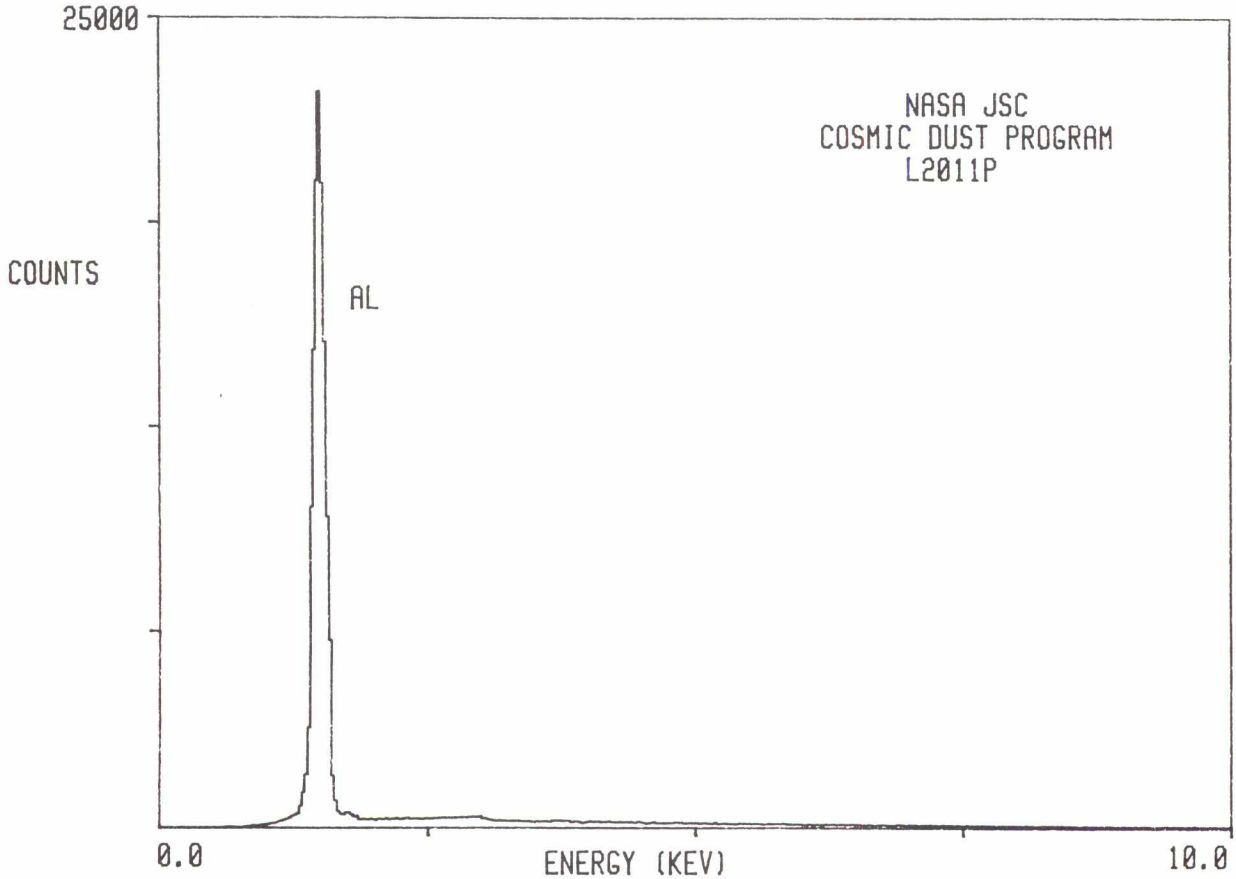
L2011 P 10



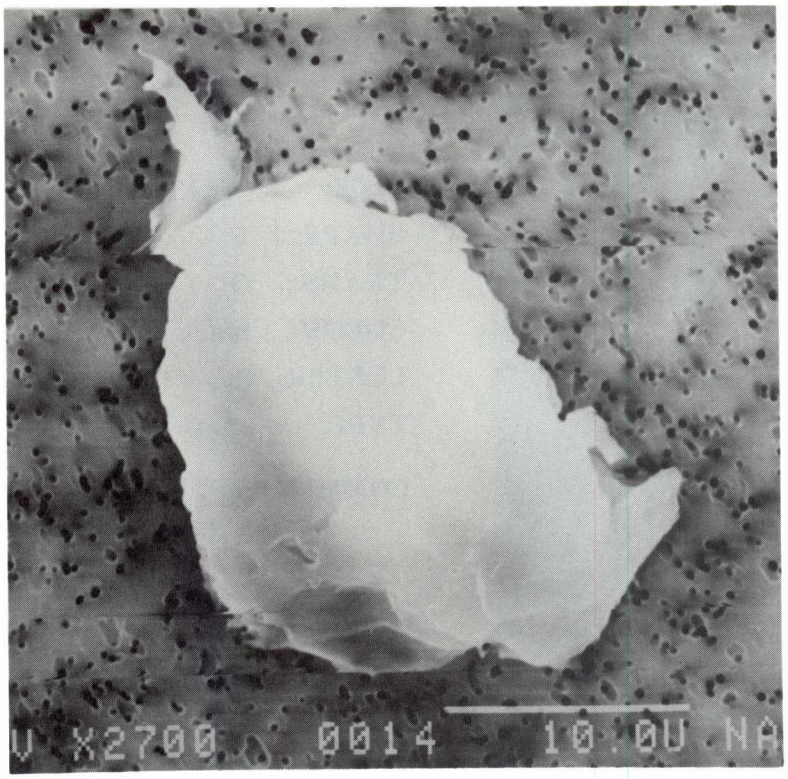
S-92-35271

SIZE: 38x16
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



L2011 R 5



S-92-35238

SIZE: 28x20

SHAPE: I

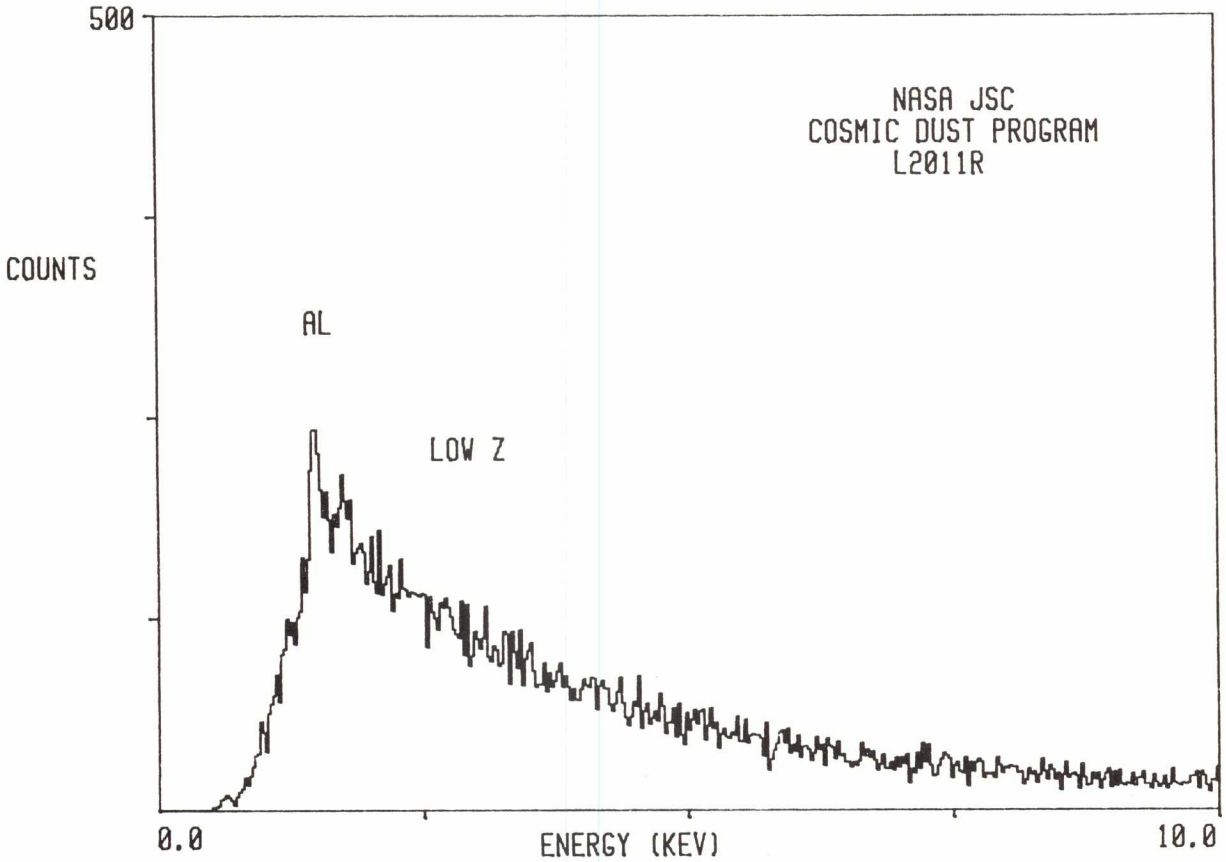
TRANS.: O

COLOR: Silver

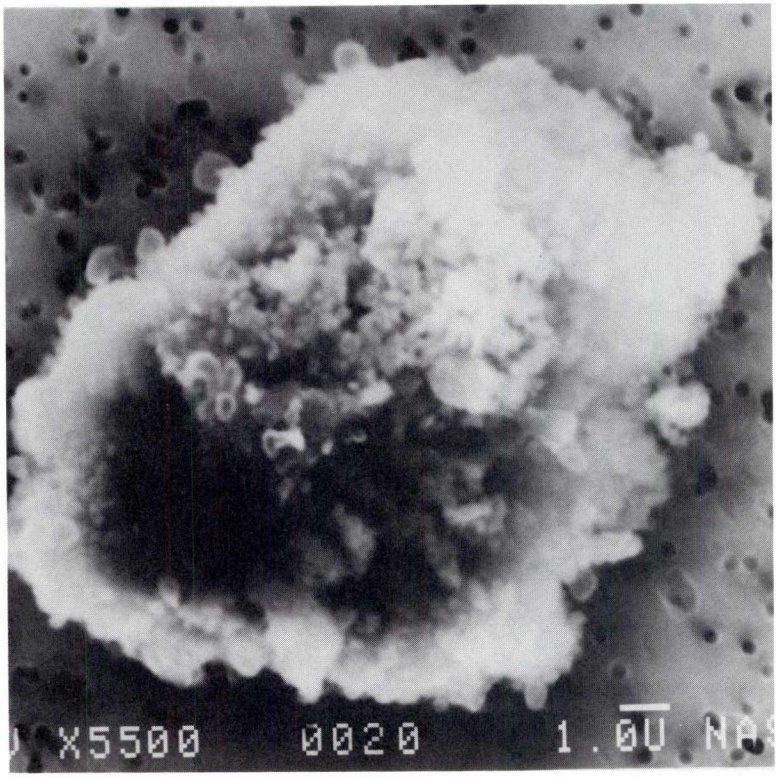
LUSTER: M

TYPE: TCA?

COMMENTS:



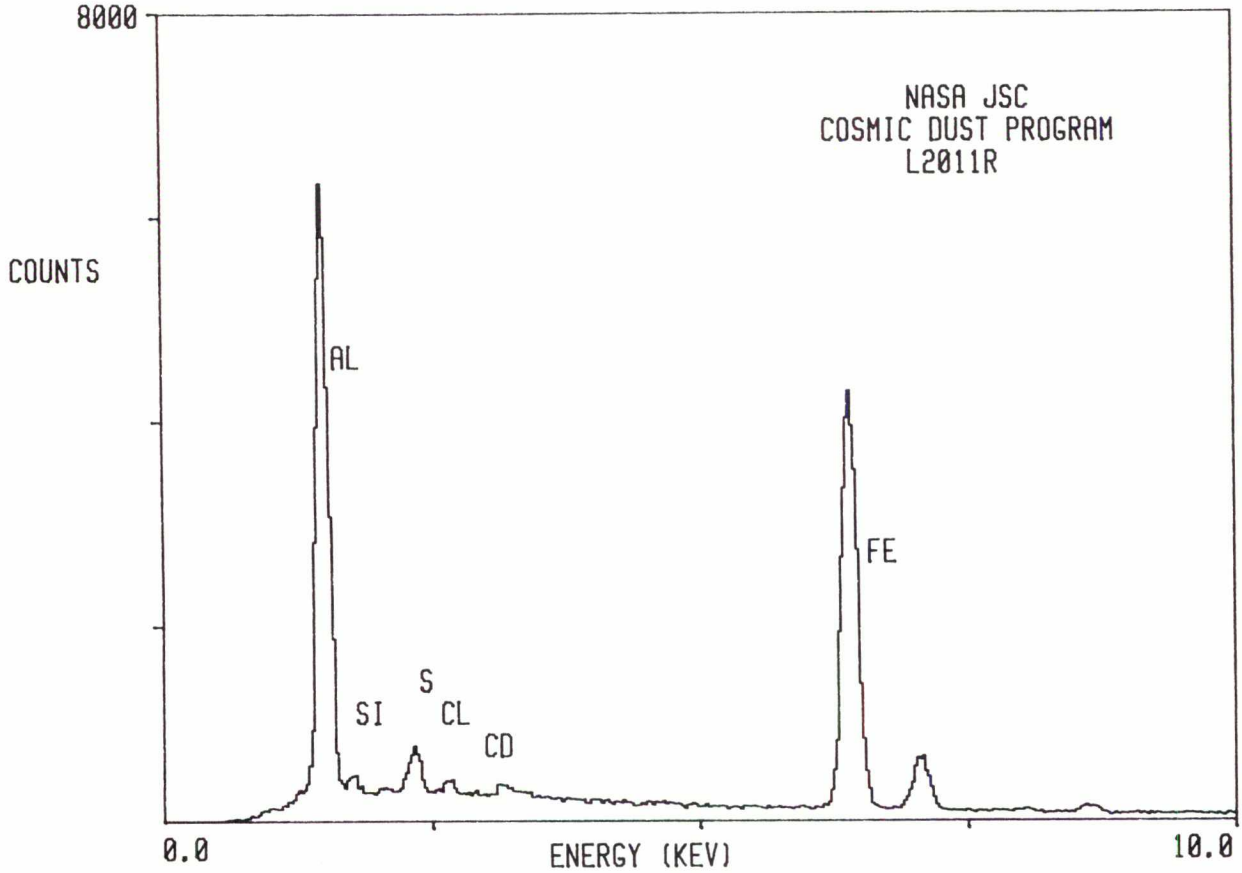
L2011 R 8



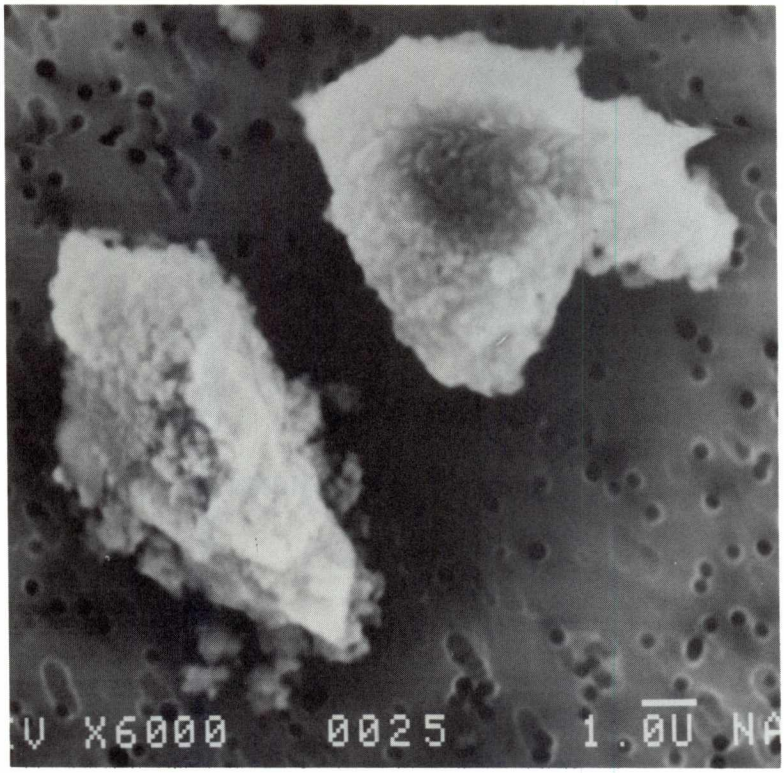
S-92-35241

SIZE: 15x13
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



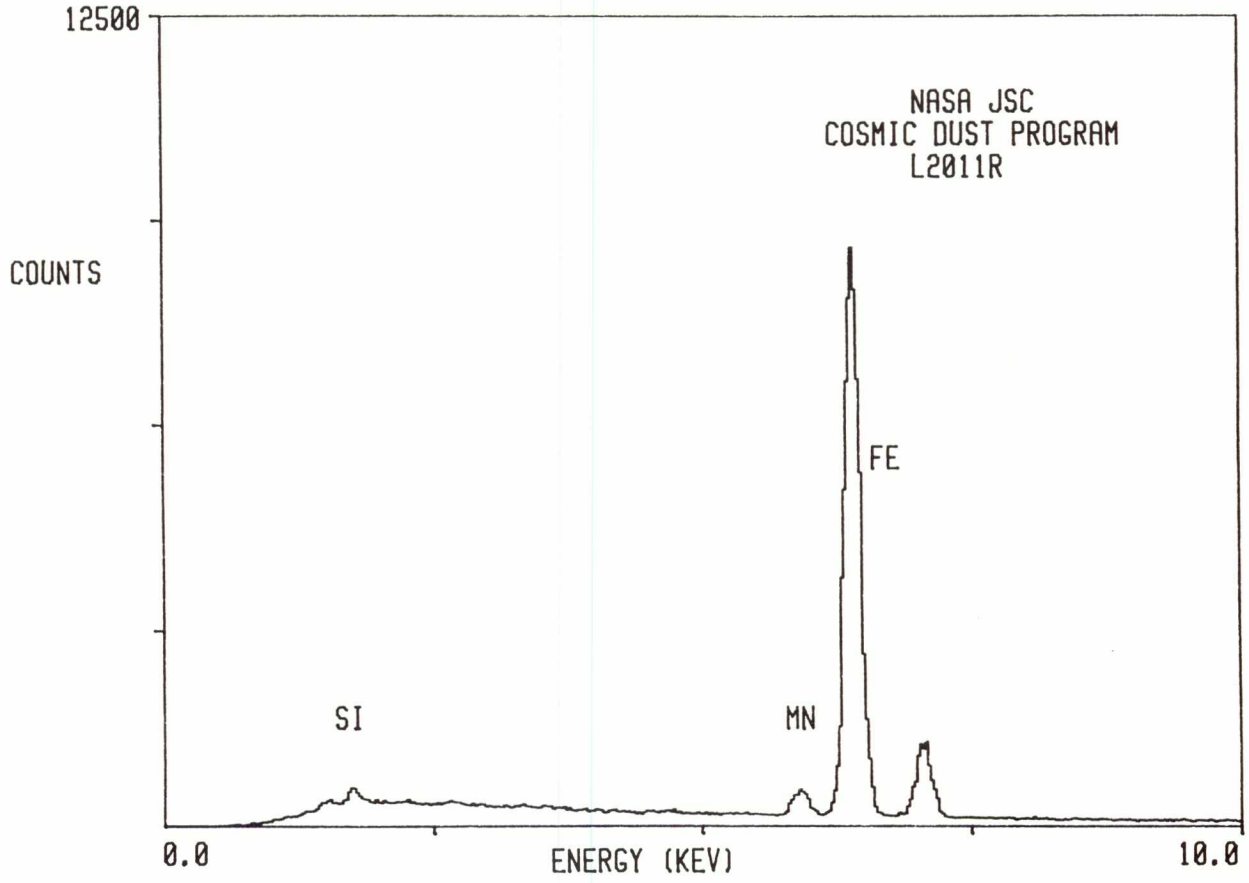
L2011 R 10



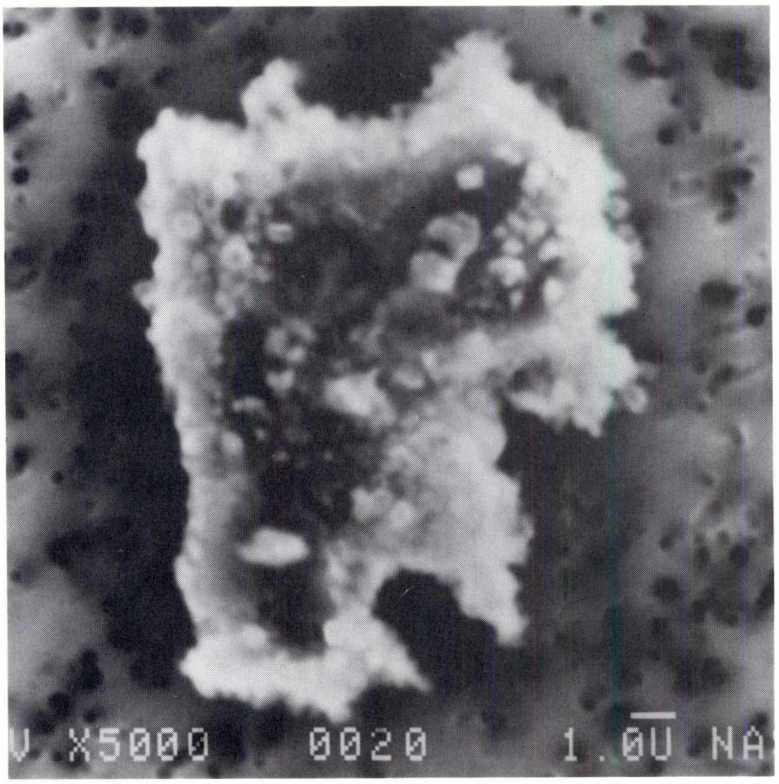
S-92-35243

SIZE: 24
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCA?

COMMENTS:



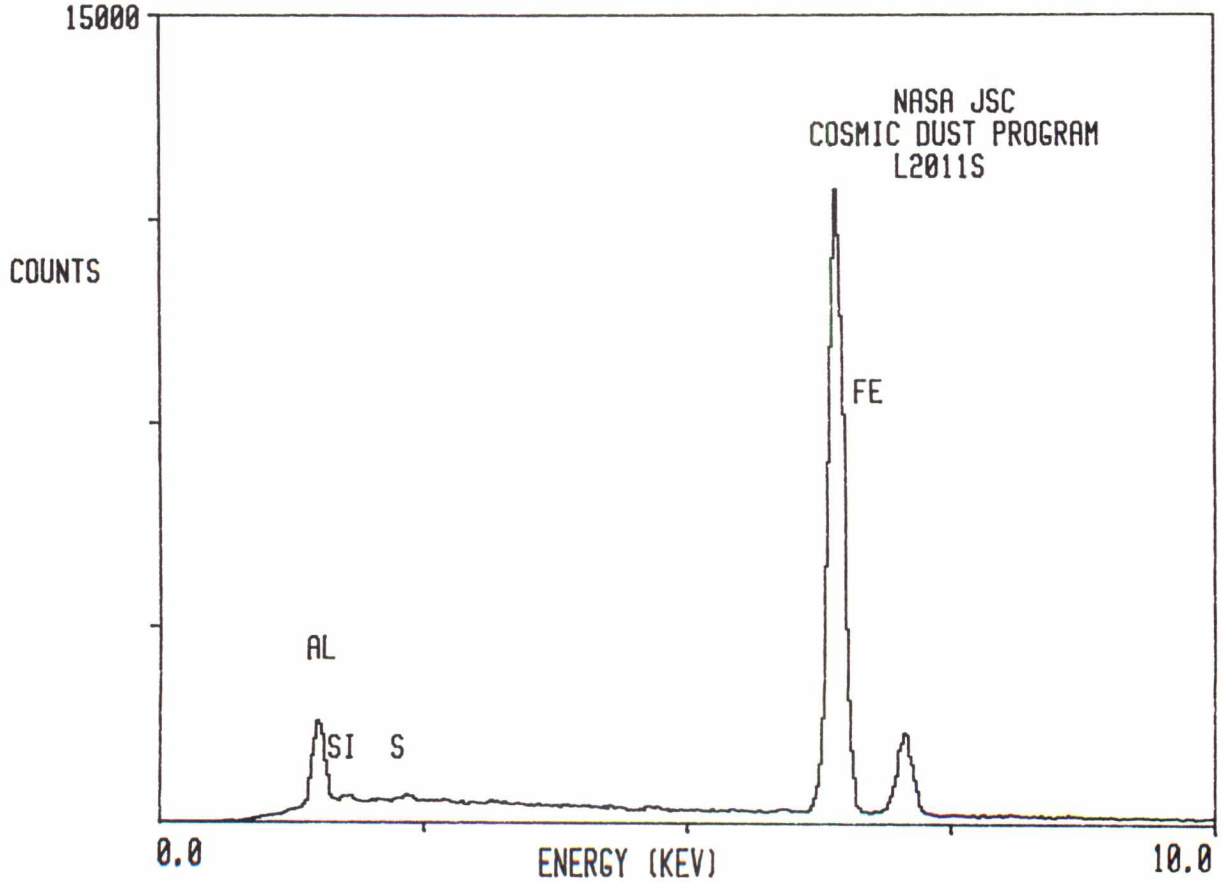
L2011 S 9



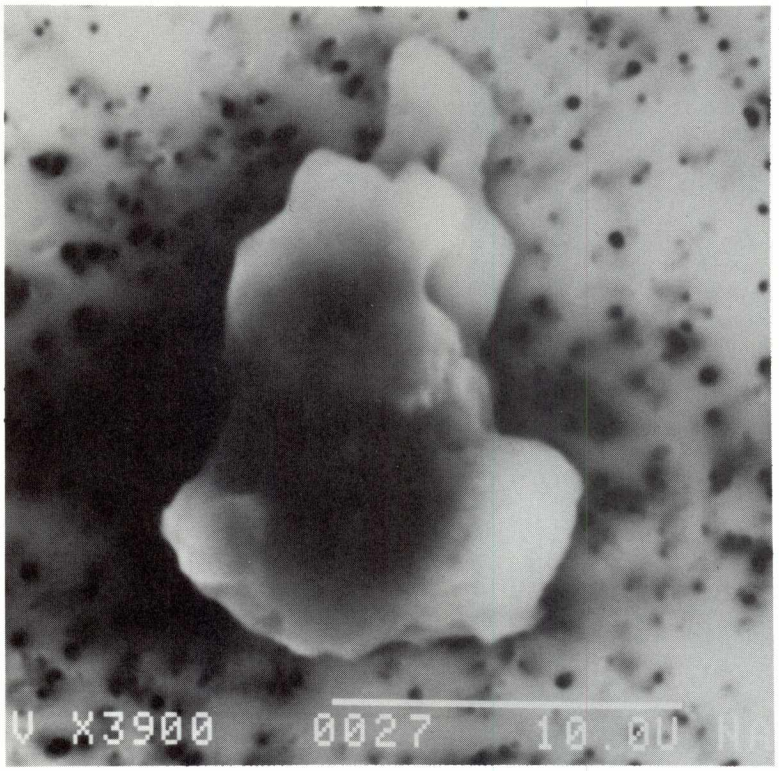
S-92-35228

SIZE: 15x12
SHAPE: I
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA

COMMENTS:



L2011 S 10



S-92-35229

SIZE: 16x12

SHAPE: I

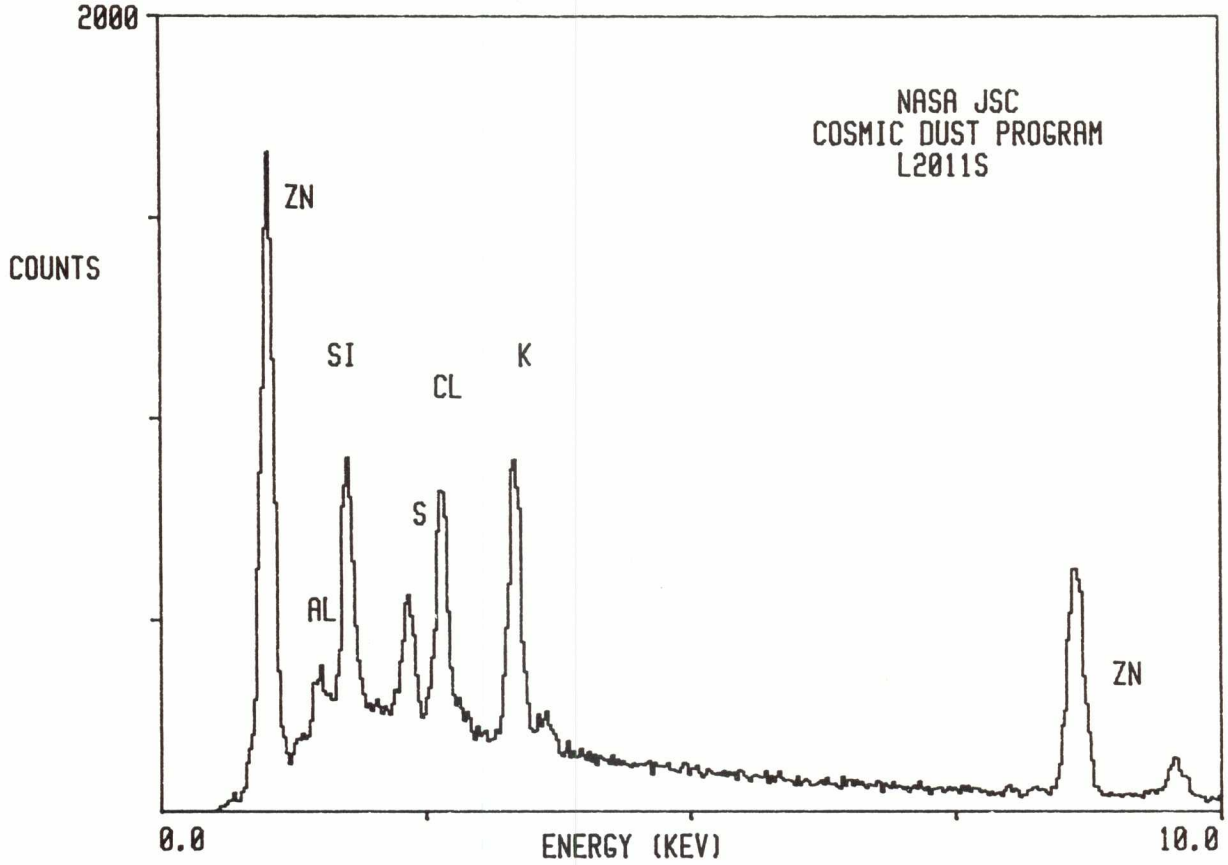
TRANS.: TL

COLOR: Colorless to Brown

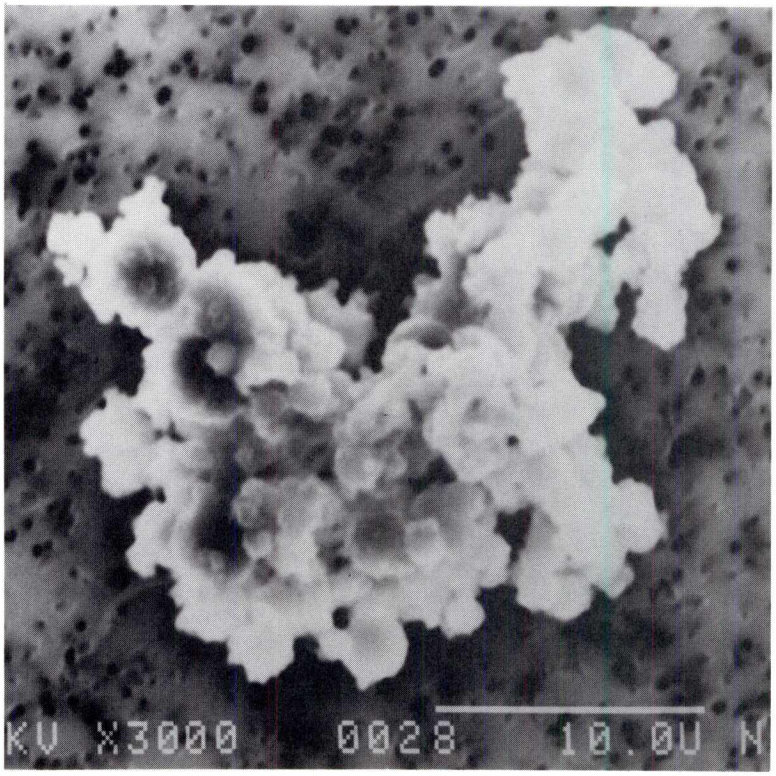
LUSTER: V

TYPE: TCA

COMMENTS:



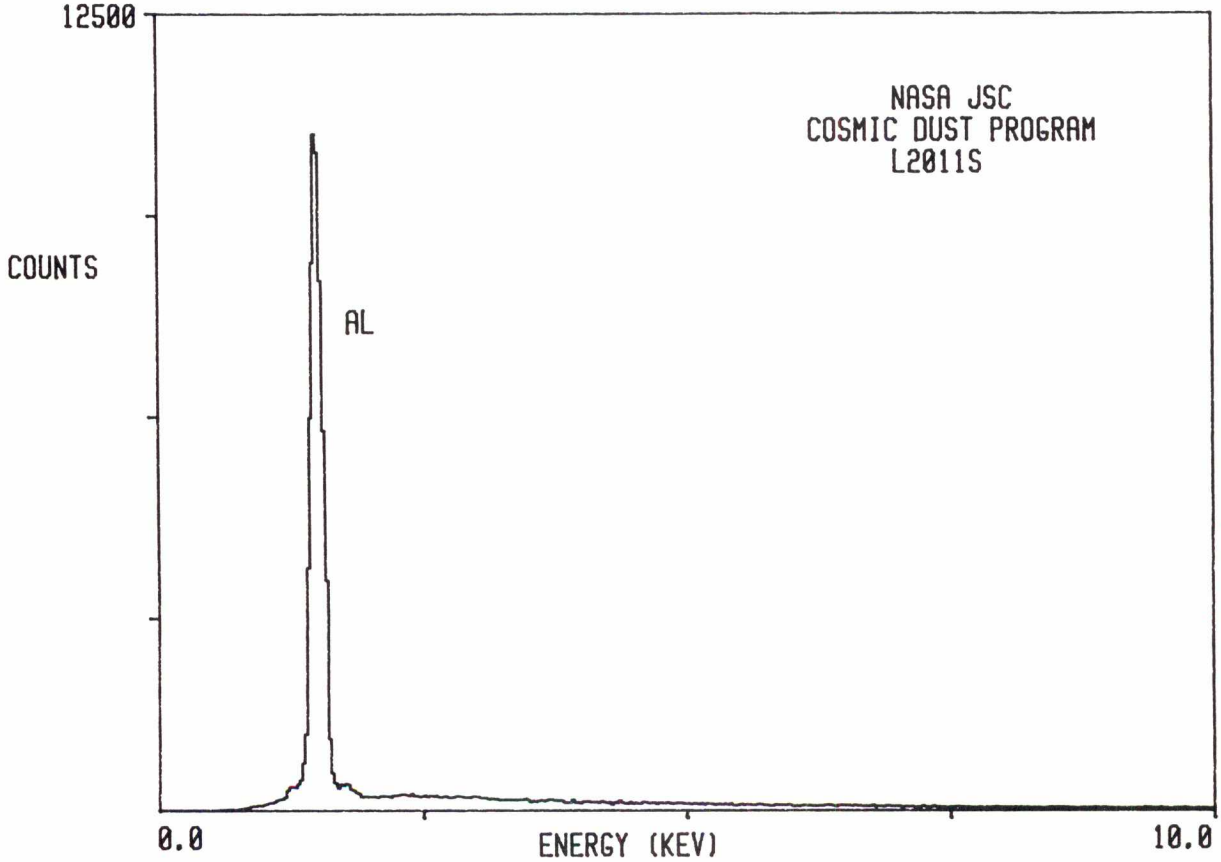
L2011 S 11



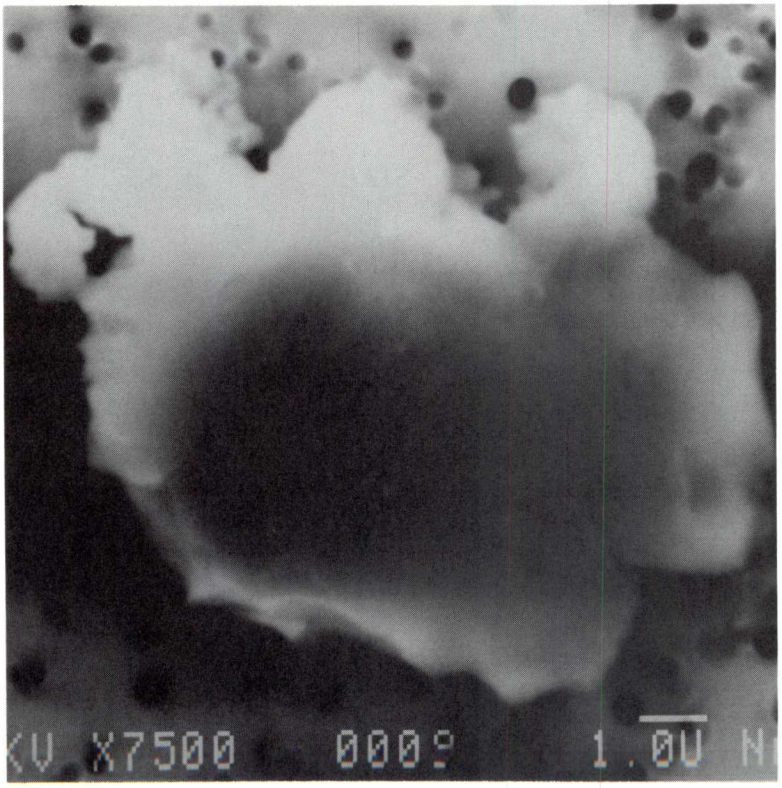
S-92-35230

SIZE: 26x22
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCA

COMMENTS:



L2011 T 1



S-92-35958

SIZE: 12x8

SHAPE: I

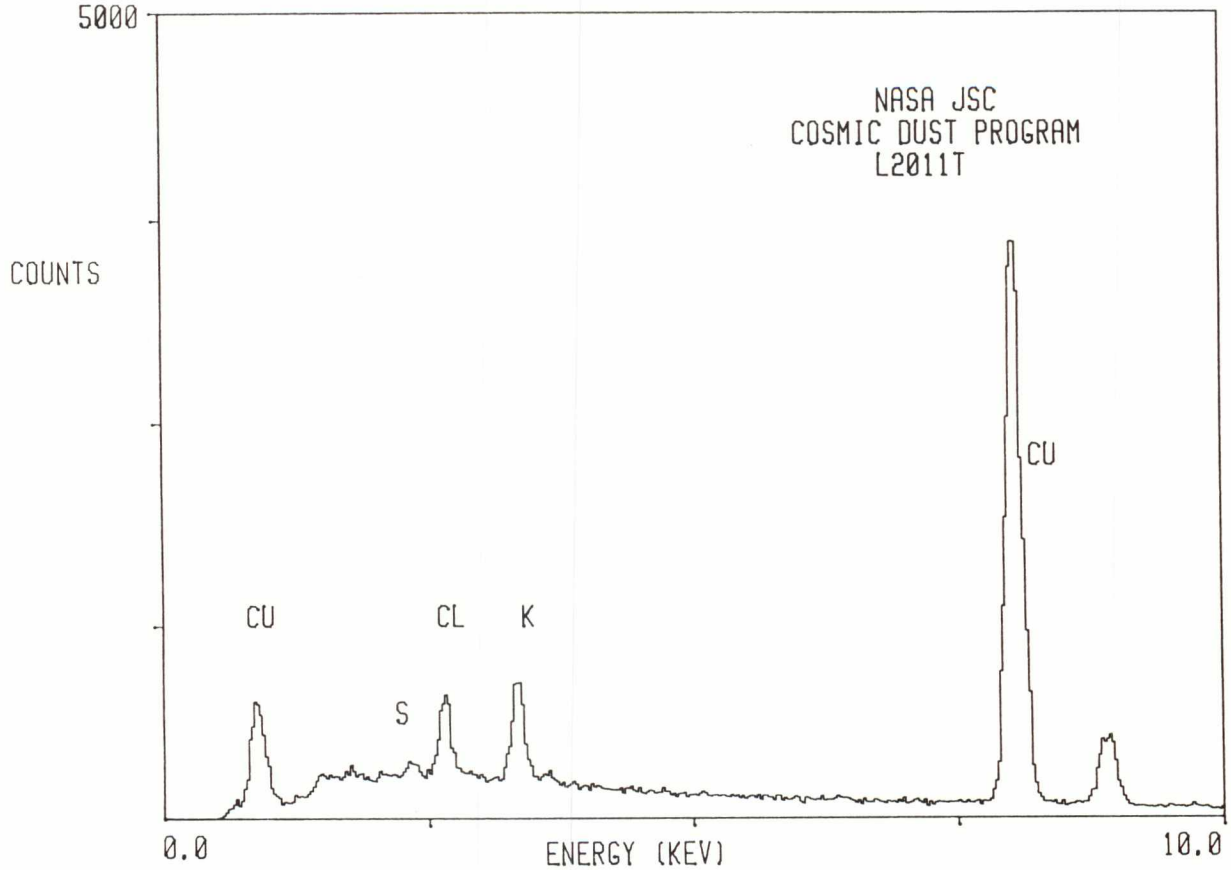
TRANS.: O

COLOR: White to Black

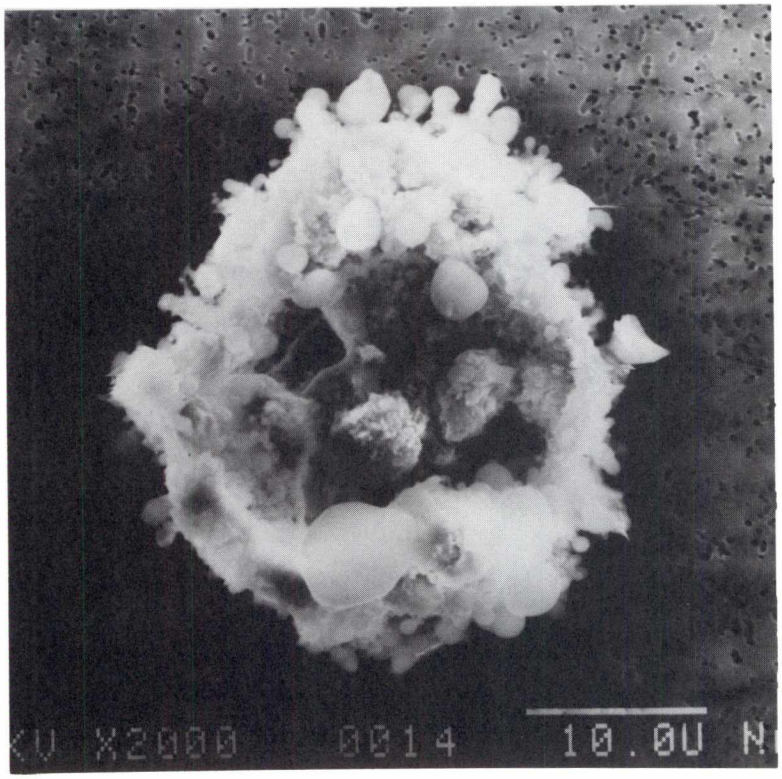
LUSTER: R

TYPE: TCA

COMMENTS:



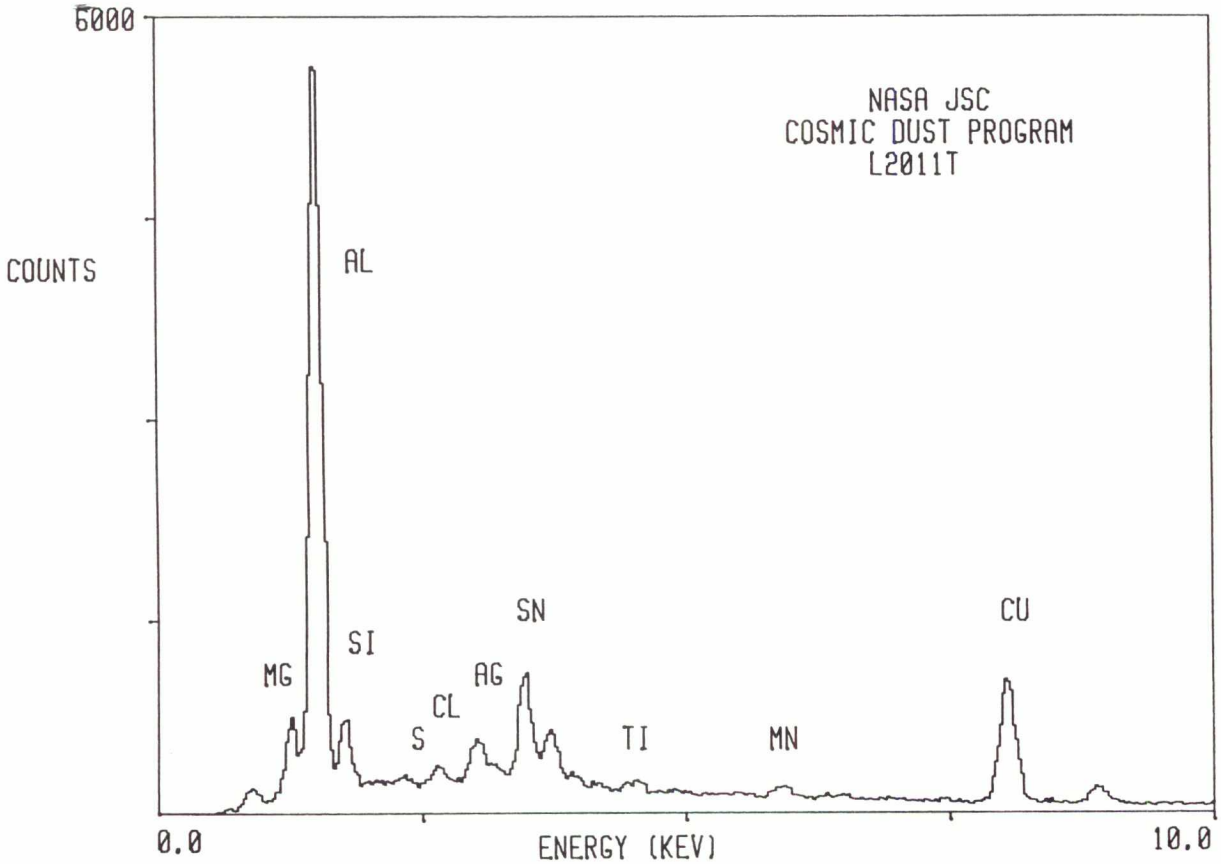
L2011 T 4



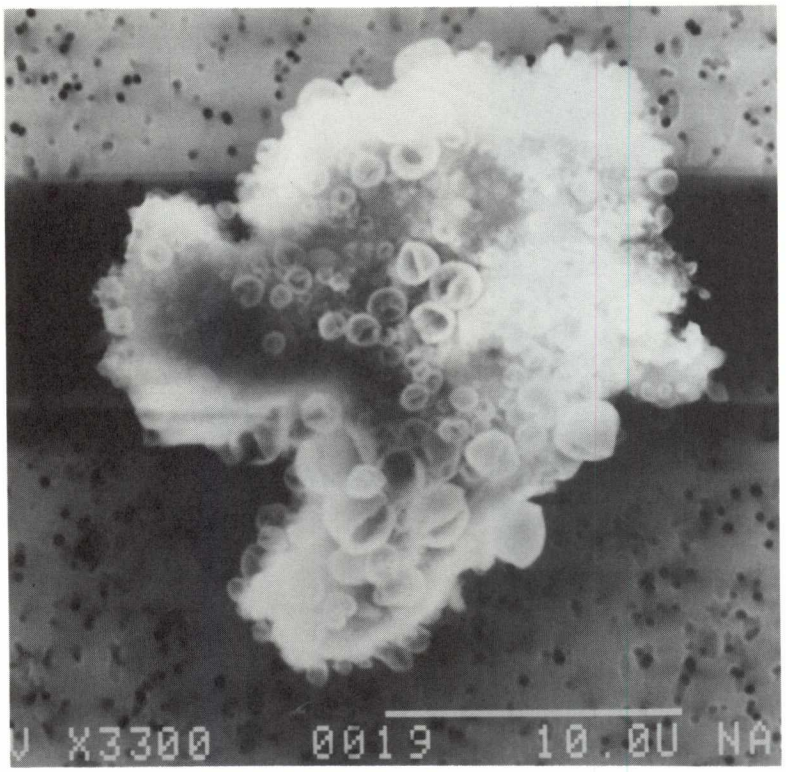
S-92-35961

SIZE: 35x28
SHAPE: E
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA

COMMENTS:



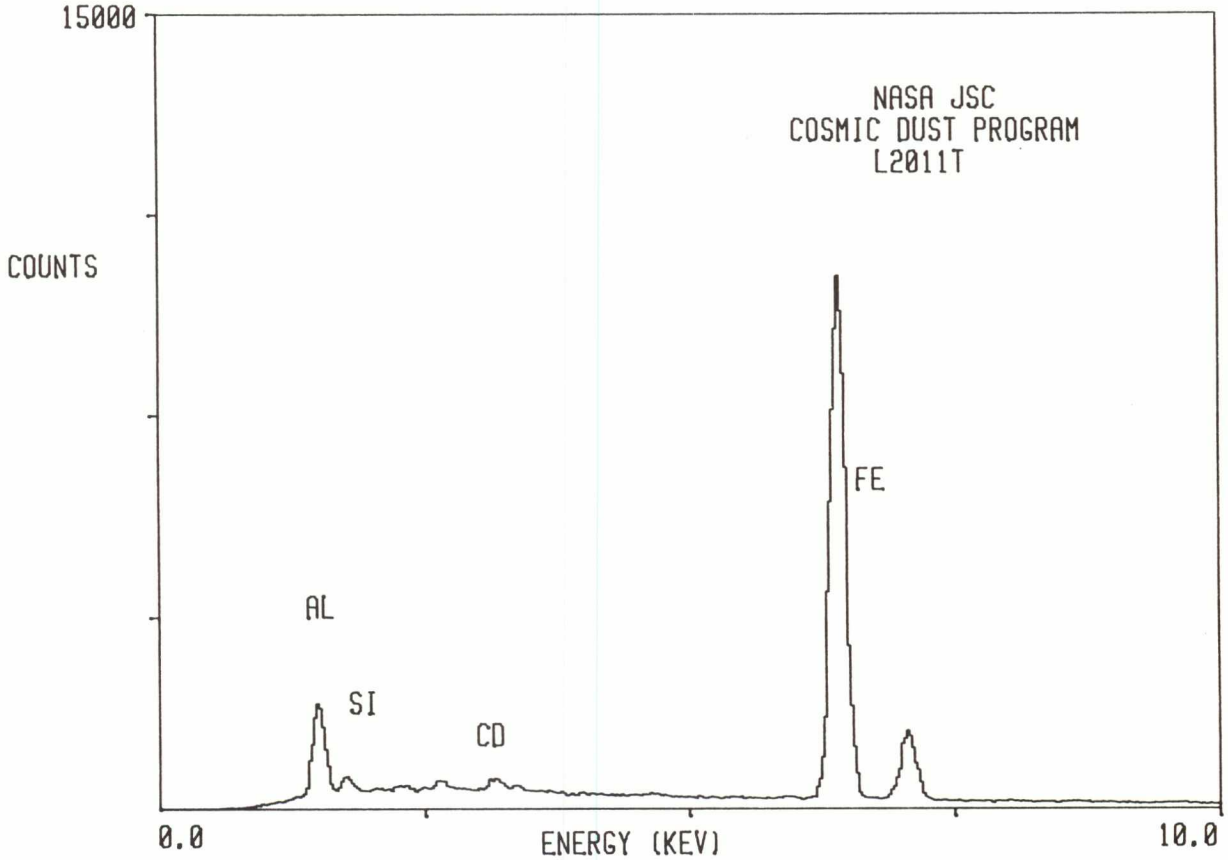
L2011 T 5



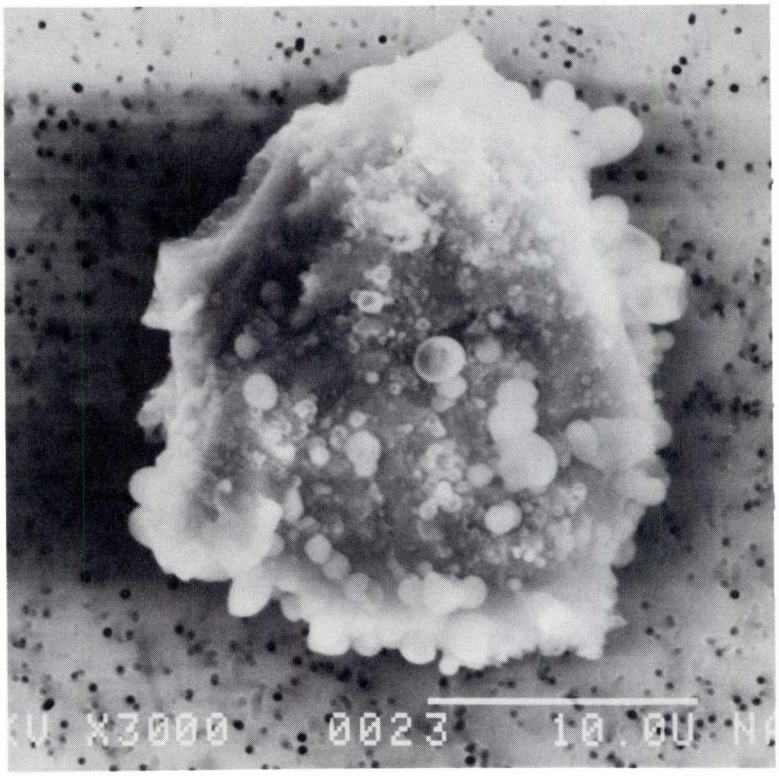
S-92-35962

SIZE: 19x17
SHAPE: E
TRANS.: O
COLOR: Brown
LUSTER: SM
TYPE: TCA

COMMENTS:



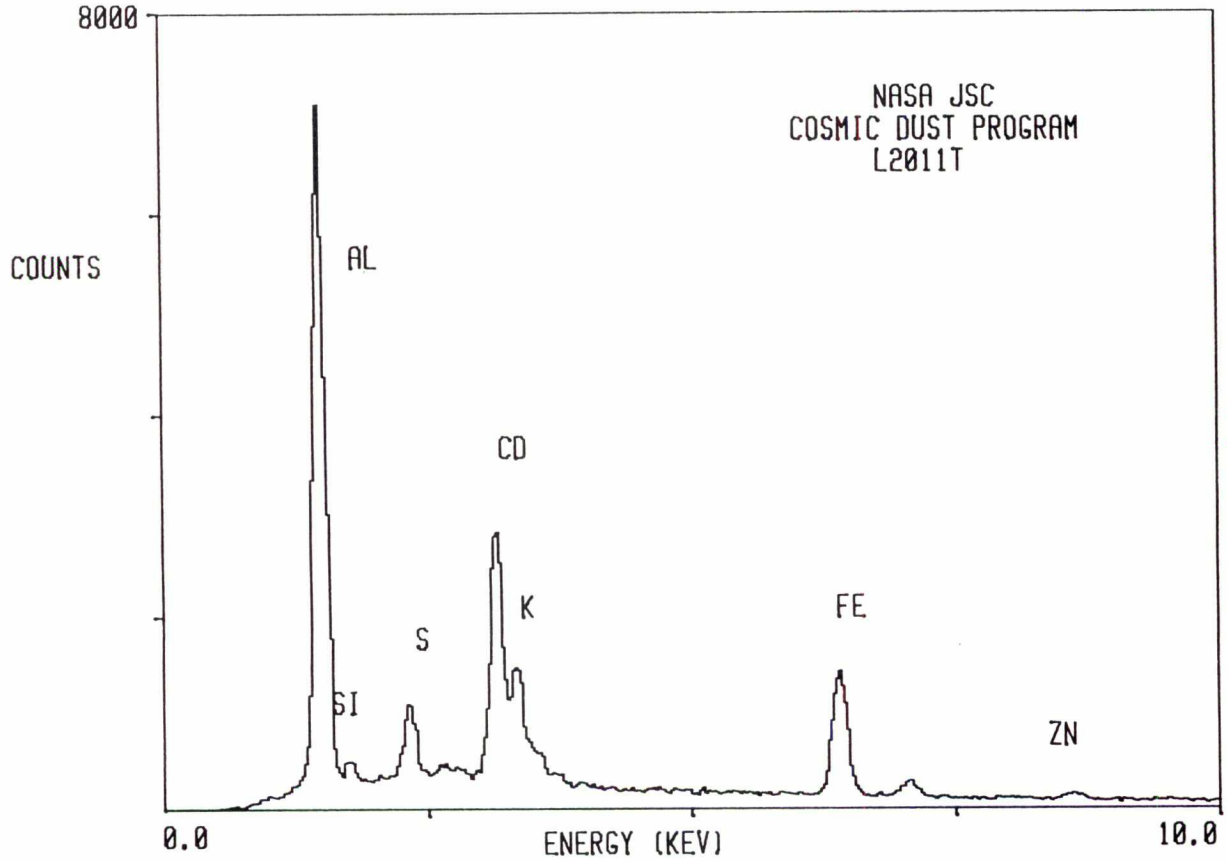
L2011 T 7



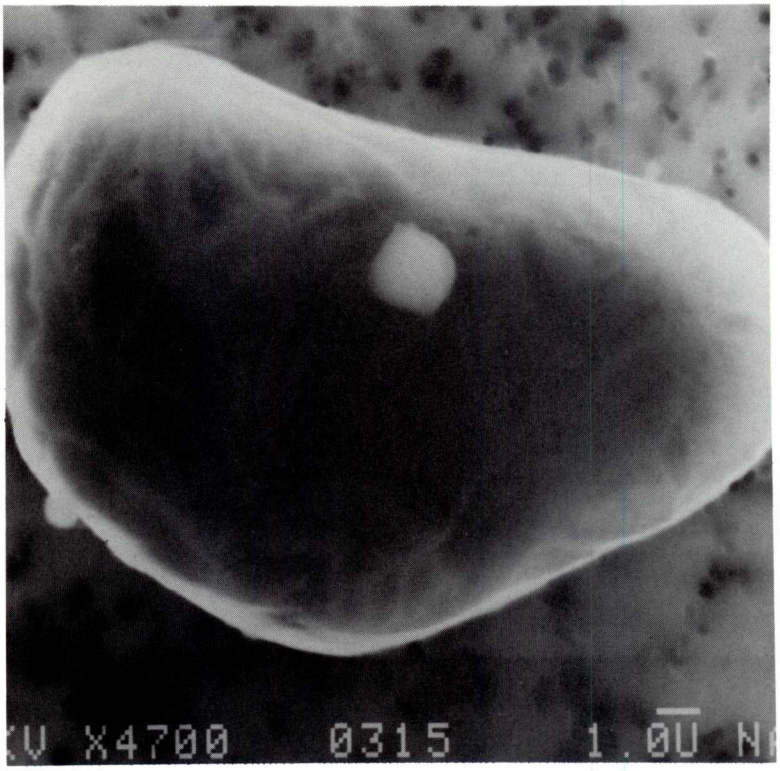
S-92-35964

SIZE: 24x20
SHAPE: E
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA

COMMENTS:



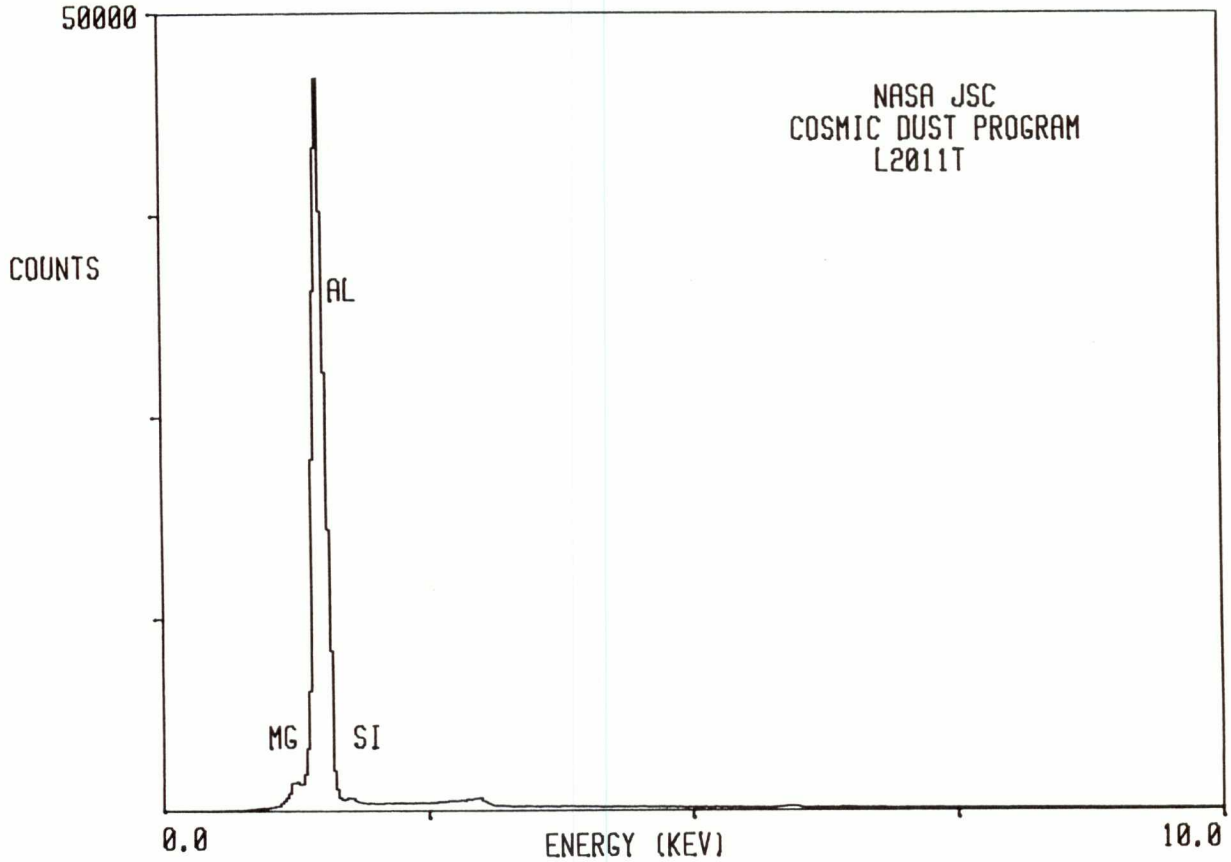
L2011 T 8



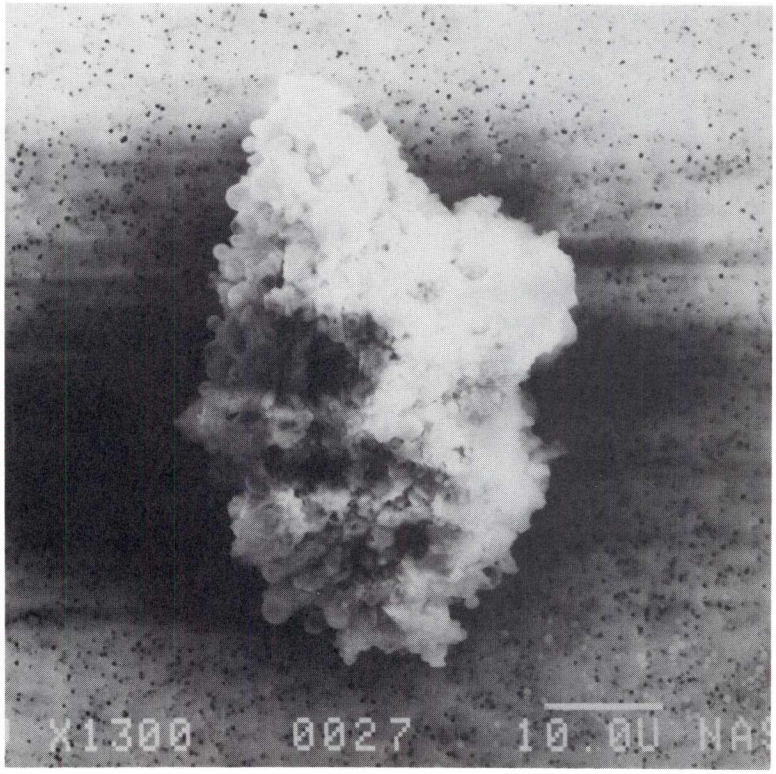
S-92-35965

SIZE: 20x12
SHAPE: E
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA

COMMENTS:



L2011 T 9



S-92-35966

SIZE: 53x35

SHAPE: I

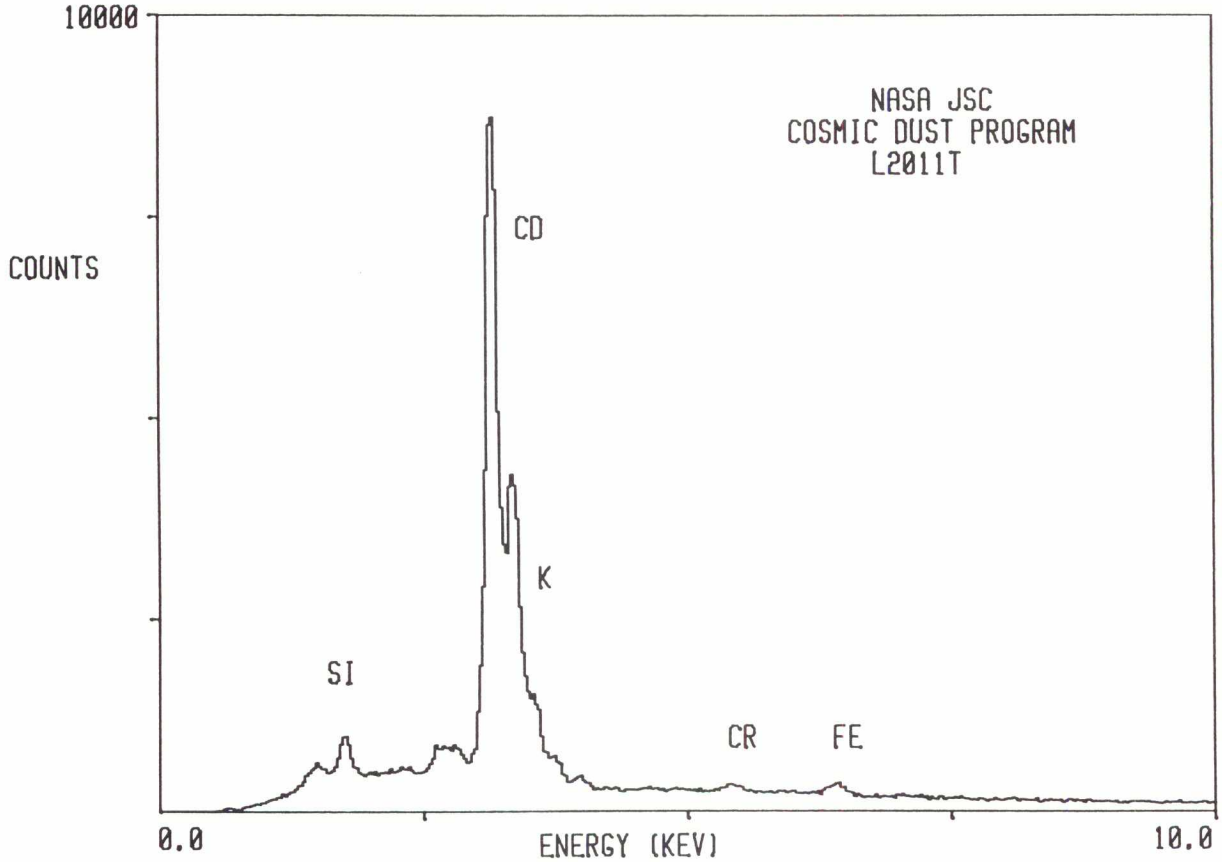
TRANS.: O

COLOR: Colorless to Brown

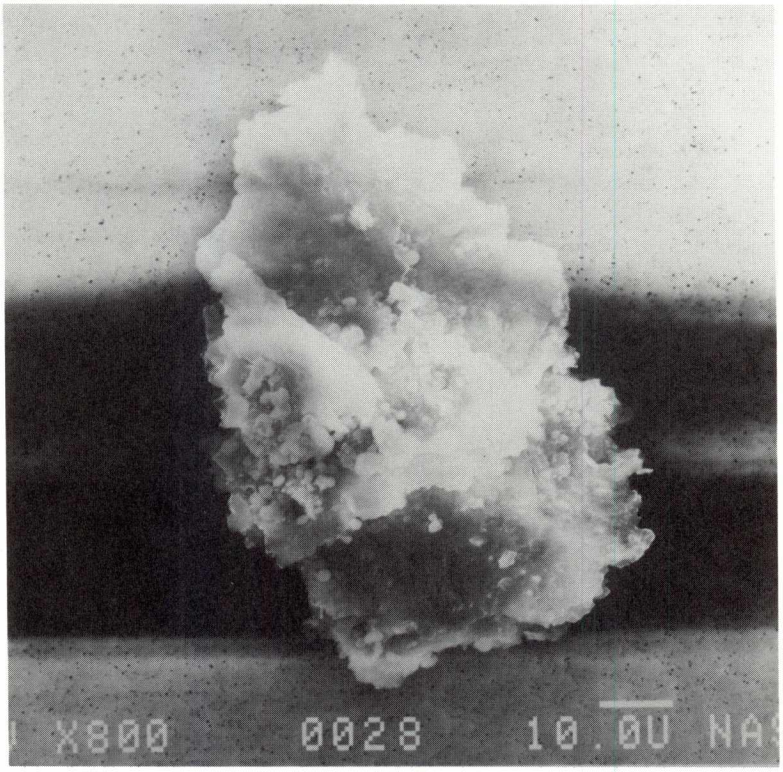
LUSTER: V

TYPE: TCA

COMMENTS:



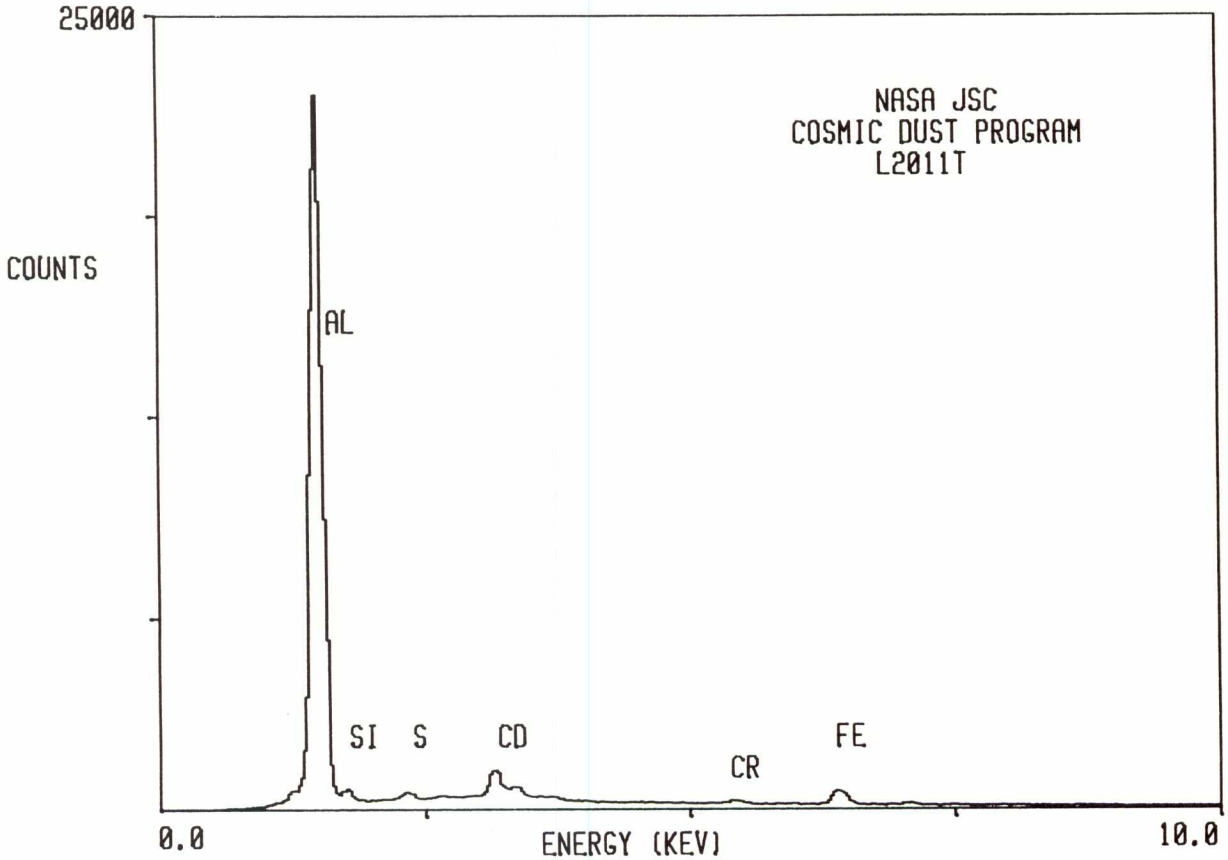
L2011 T 10



SIZE: 86x50
SHAPE: I
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCA

COMMENTS:

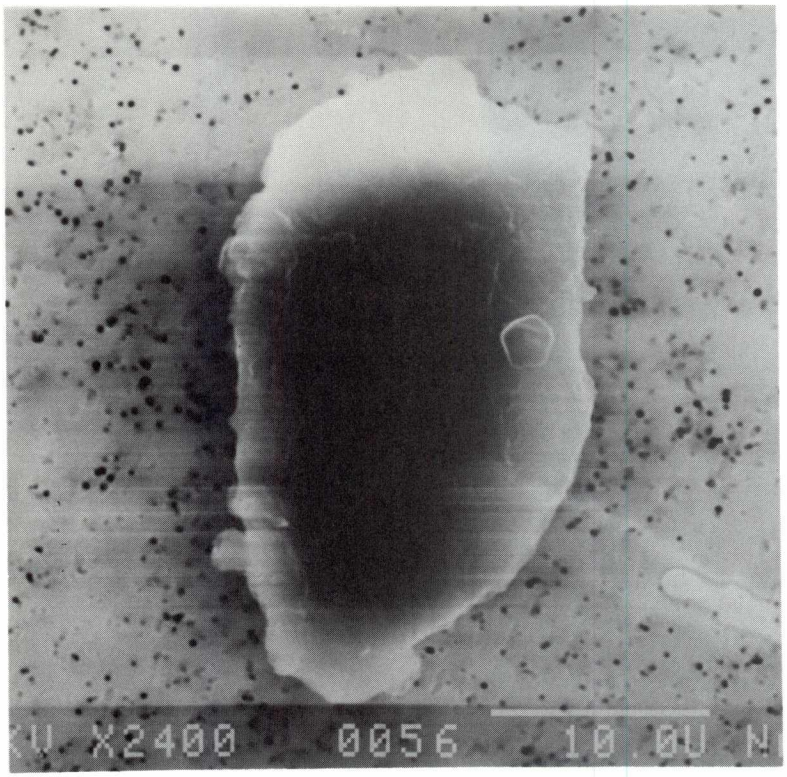
S-92-35967



Particle Descriptions

TCN Type

L2005 AB 8



S-92-35948

SIZE: 31x15

SHAPE: I

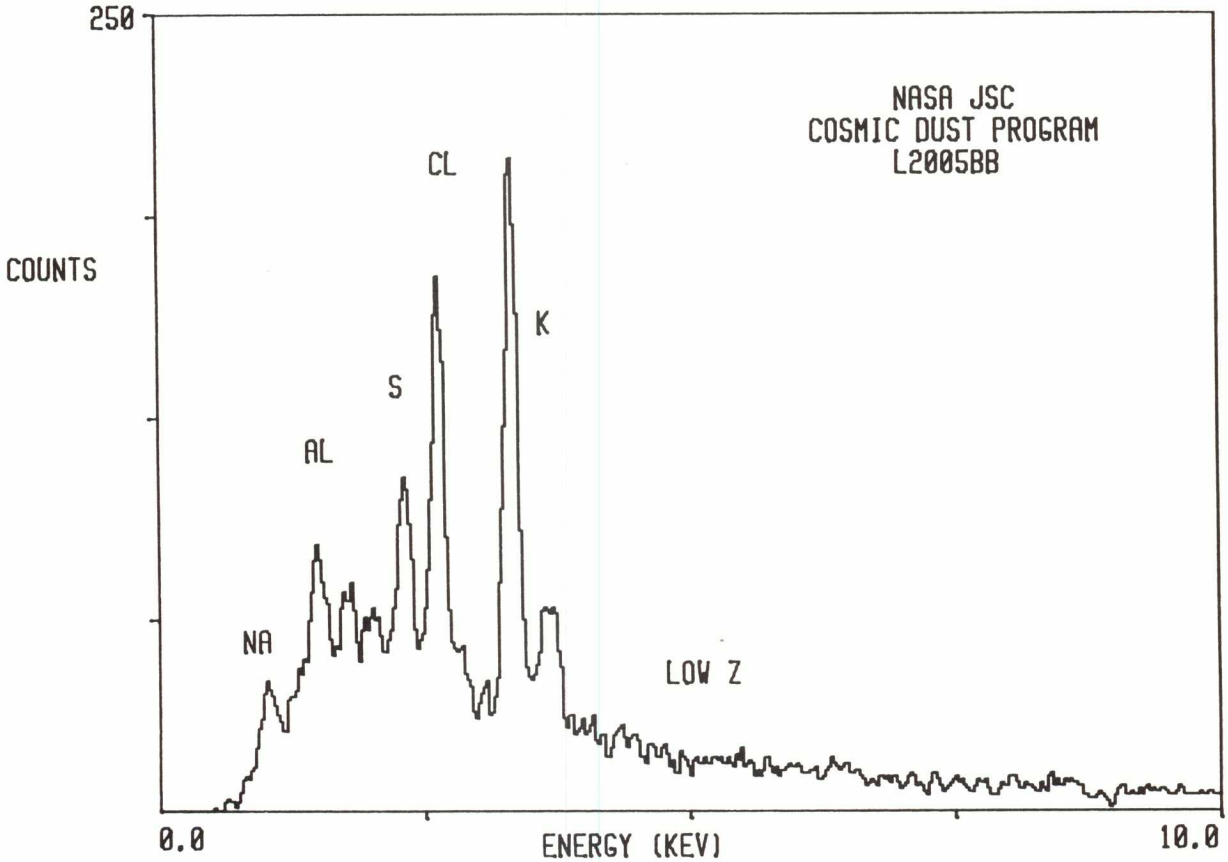
TRANS.: T

COLOR: Colorless

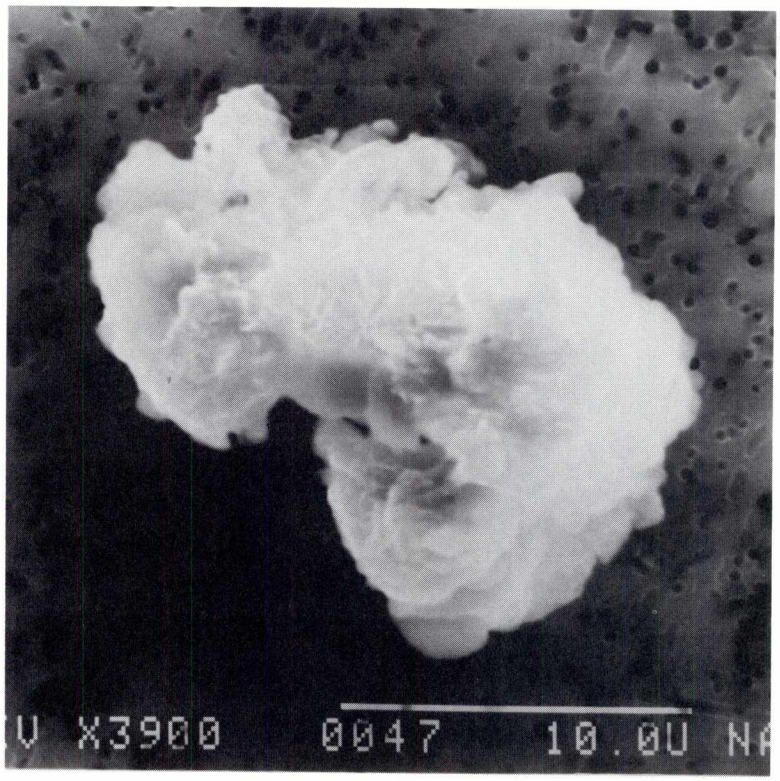
LUSTER: V

TYPE: TCN?

COMMENTS:



L2005 AB 11



S-92-35951

SIZE: 16x12

SHAPE: I

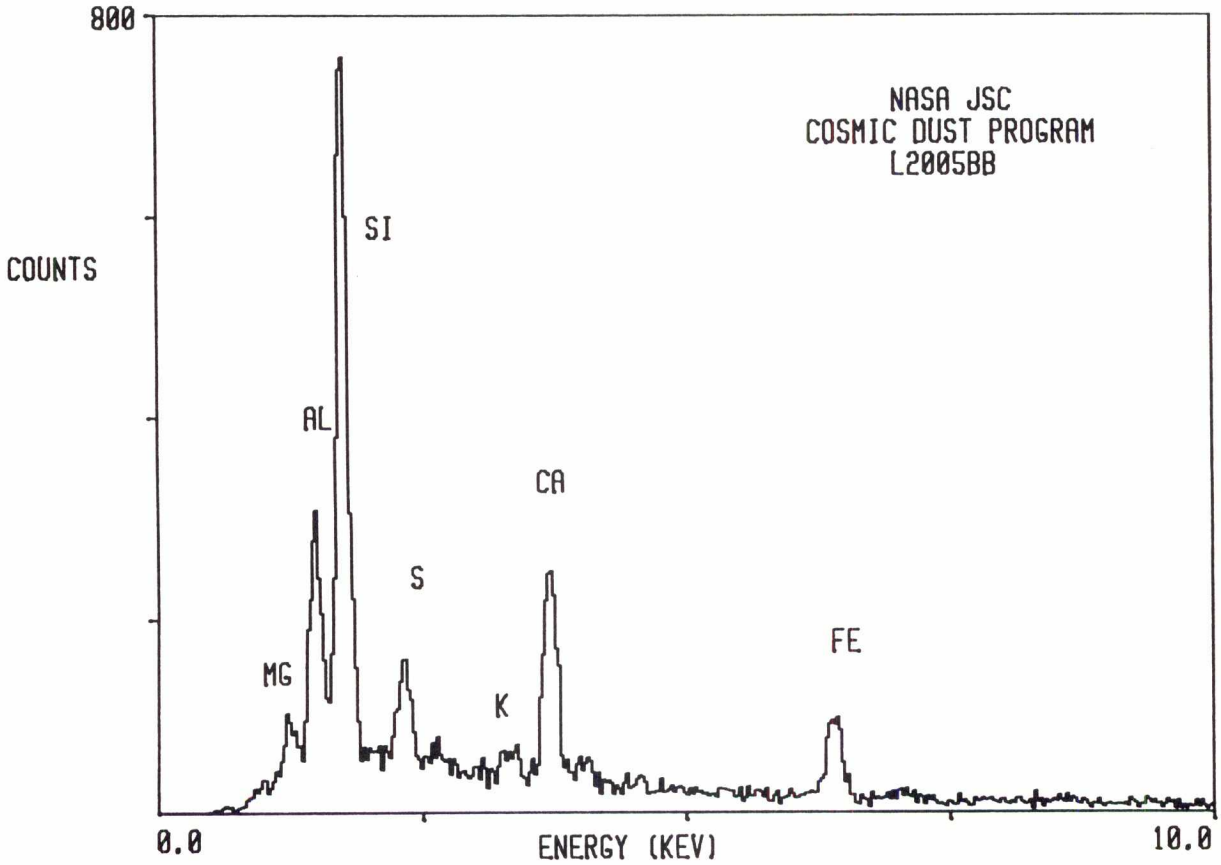
TRANS.: O

COLOR: Black

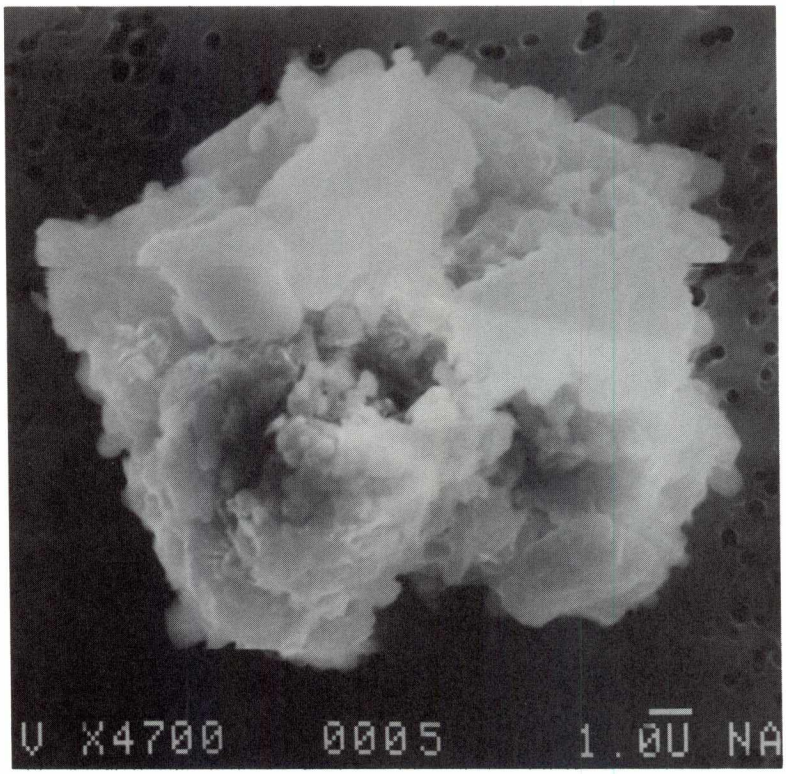
LUSTER: D

TYPE: TCN?

COMMENTS:



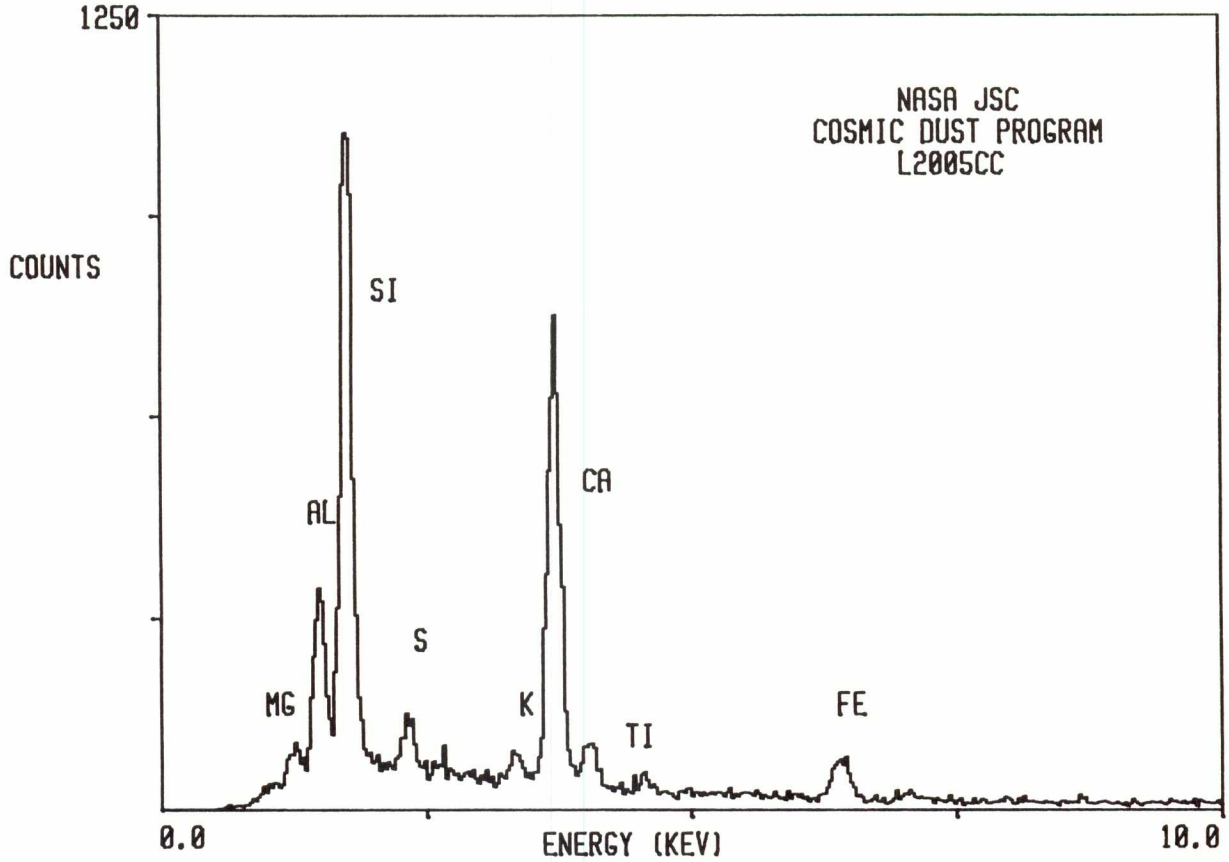
L2005 AC 2



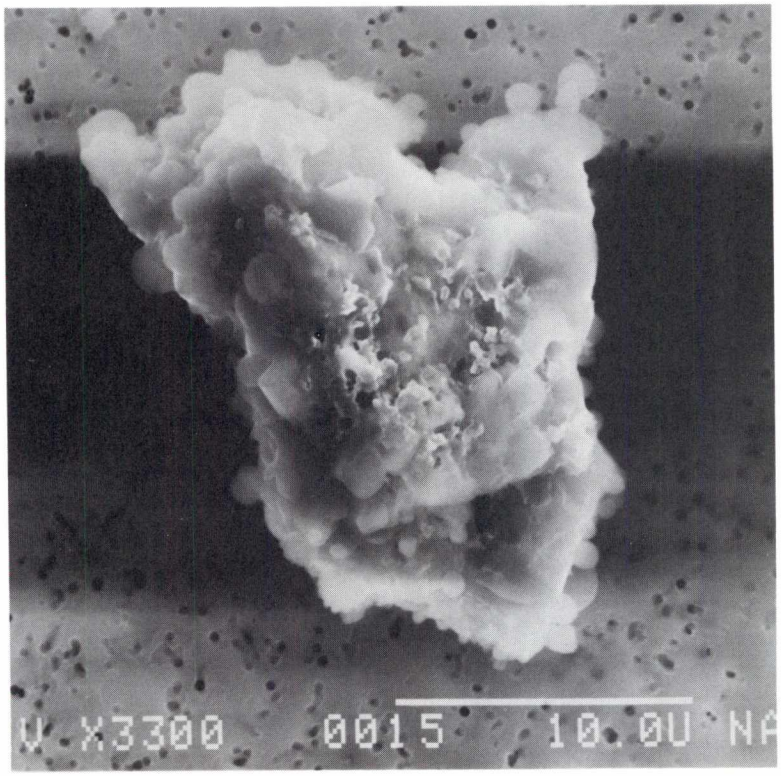
S-92-35927

SIZE: 16x15
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCN

COMMENTS:



L2005 AC 7



S-92-35932

SIZE: 22x18

SHAPE: E

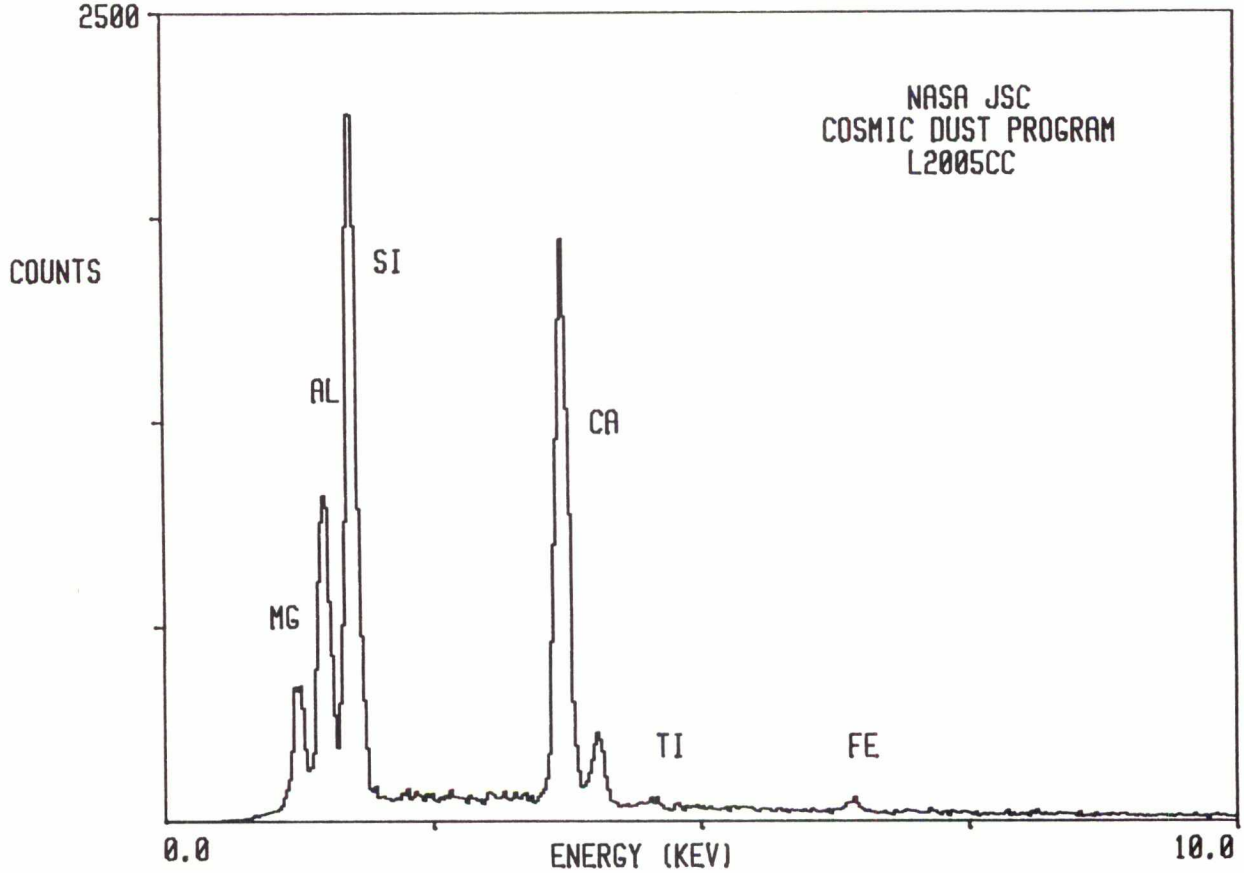
TRANS.: TL

COLOR: Colorless to Black

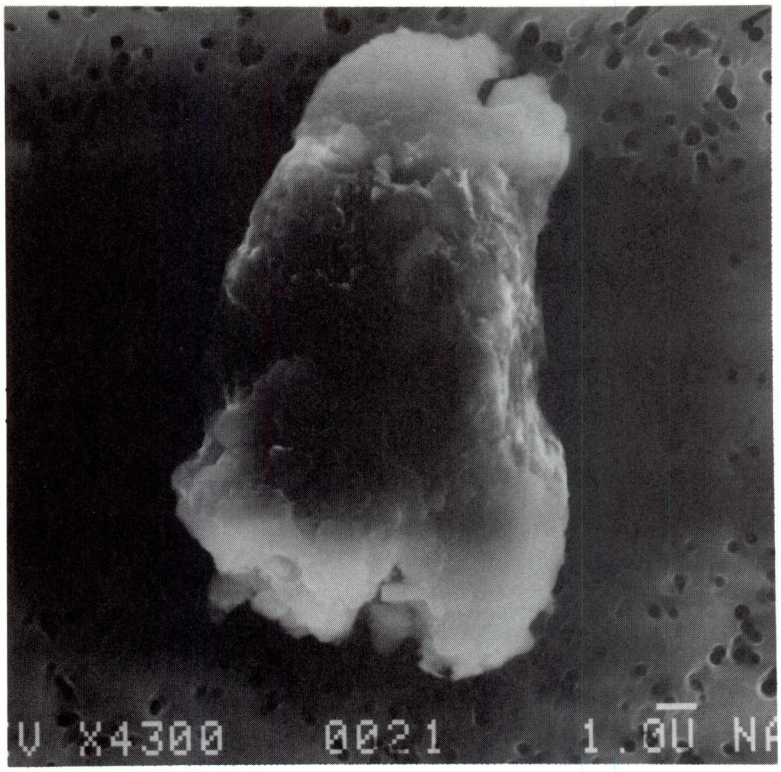
LUSTER: V

TYPE: TCN?

COMMENTS:



L2005 AC 10



S-92-35935

SIZE: 17x11

SHAPE: I

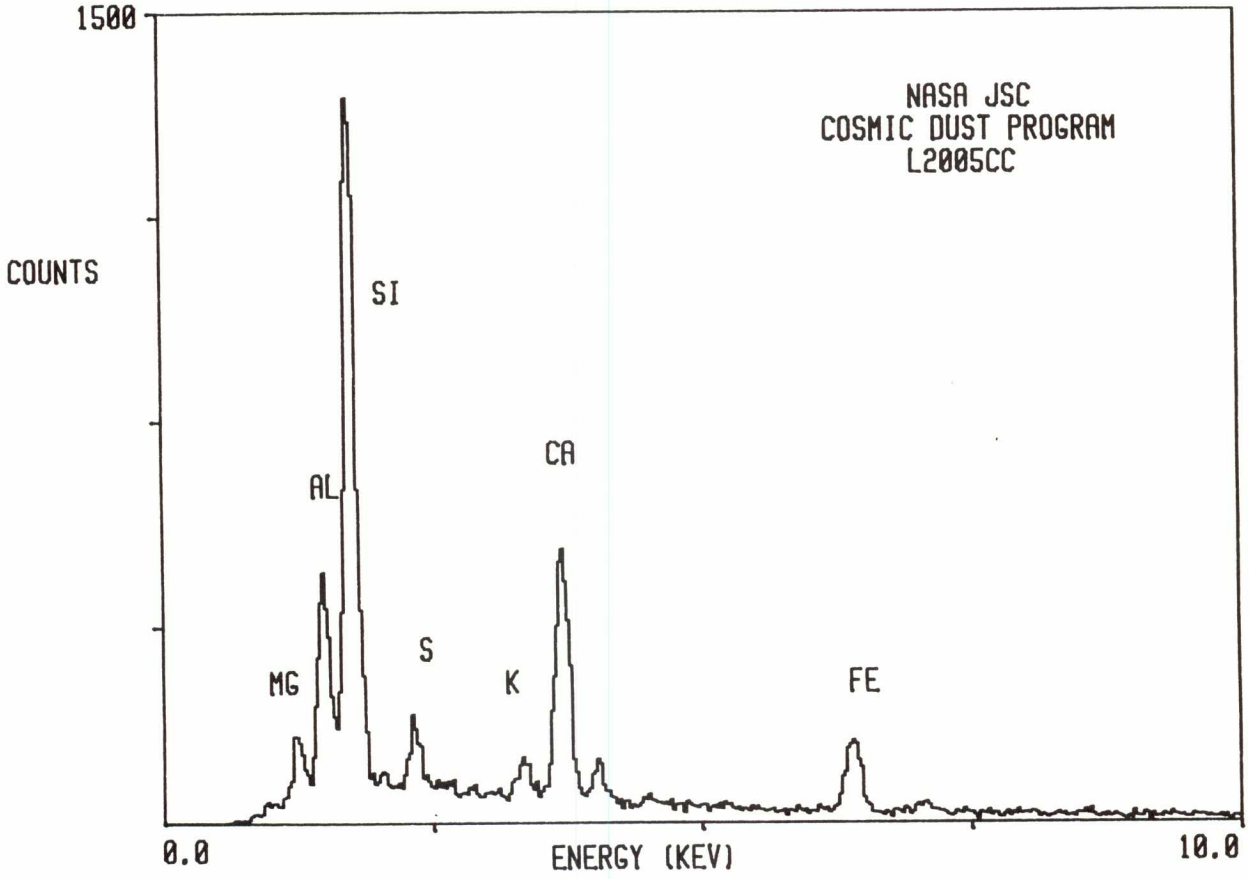
TRANS.: O

COLOR: Brown to Black

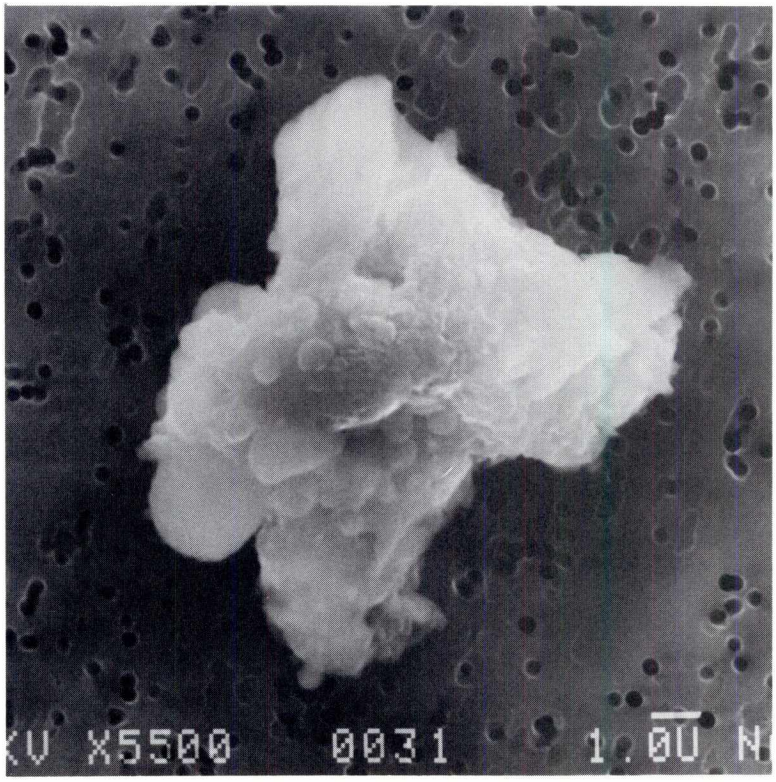
LUSTER: SM

TYPE: TCN

COMMENTS:



L2005 AC 15



S-92-35940

SIZE: 12

SHAPE: E

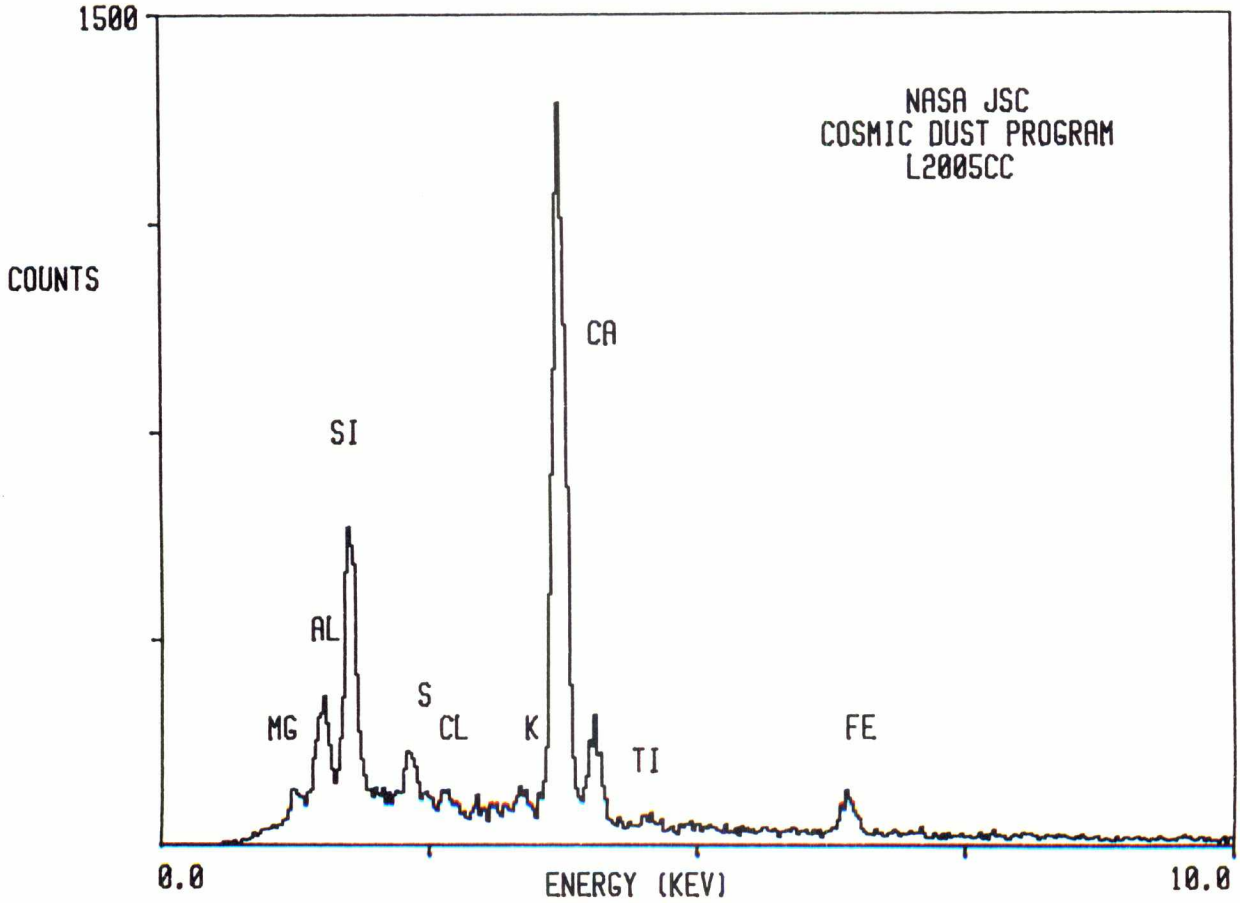
TRANS.: O

COLOR: White to Black

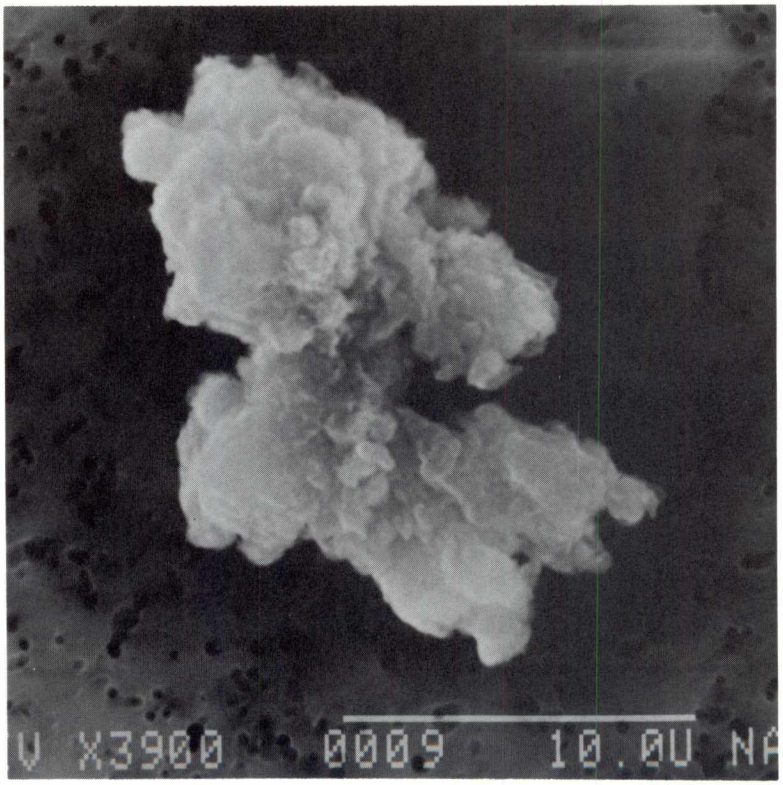
LUSTER: D

TYPE: TCN?

COMMENTS:



L2005 AD 22



S-92-35922

SIZE: 18x14

SHAPE: I

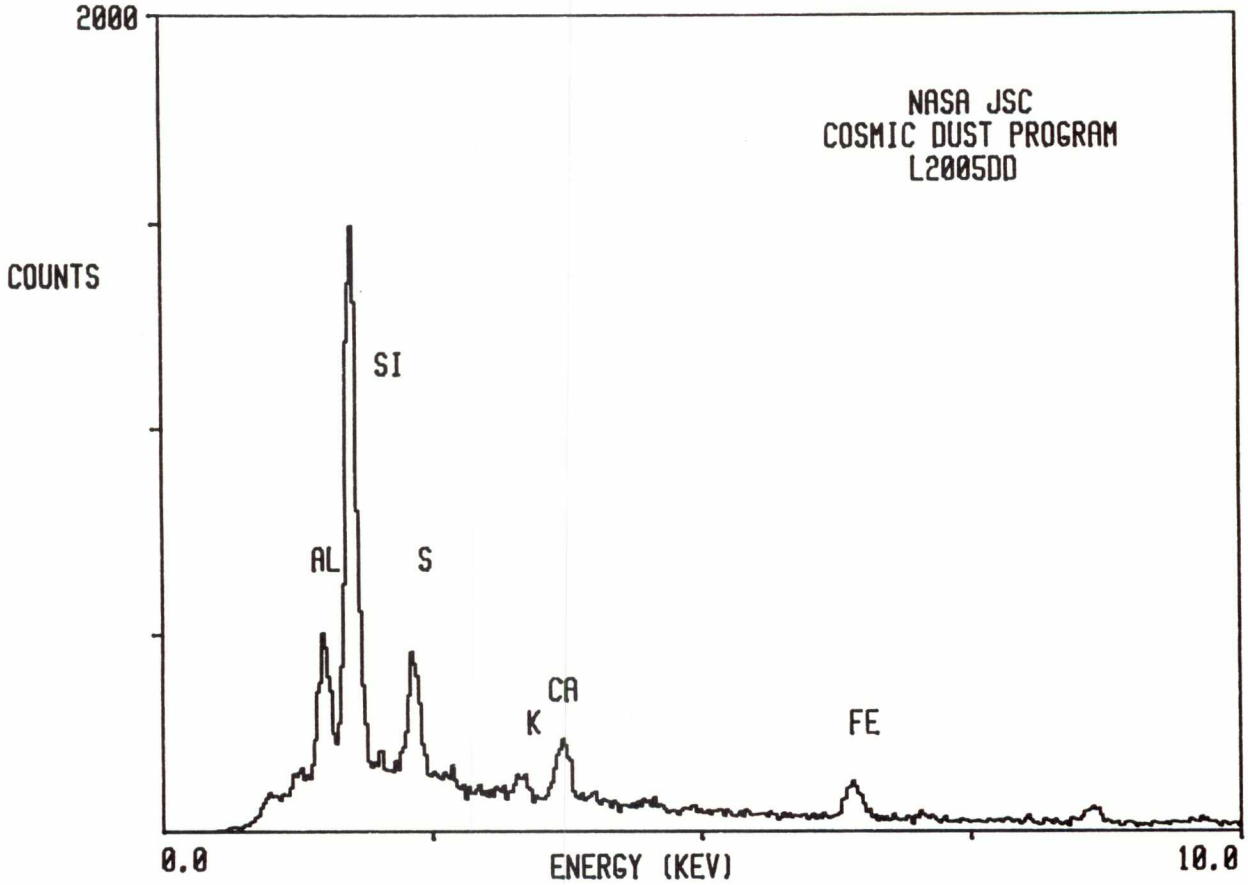
TRANS.: O

COLOR: Black

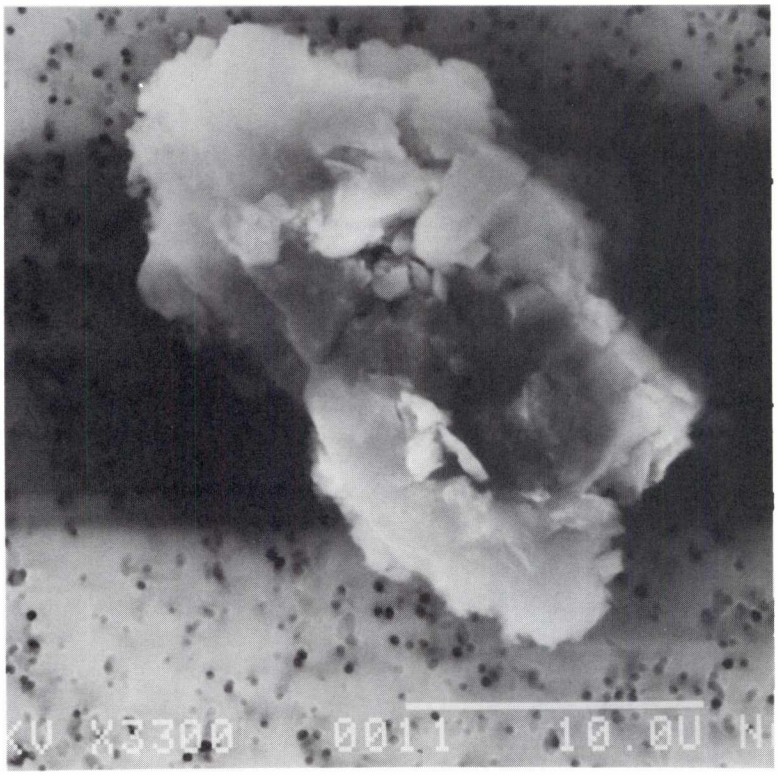
LUSTER: D

TYPE: TCN

COMMENTS:



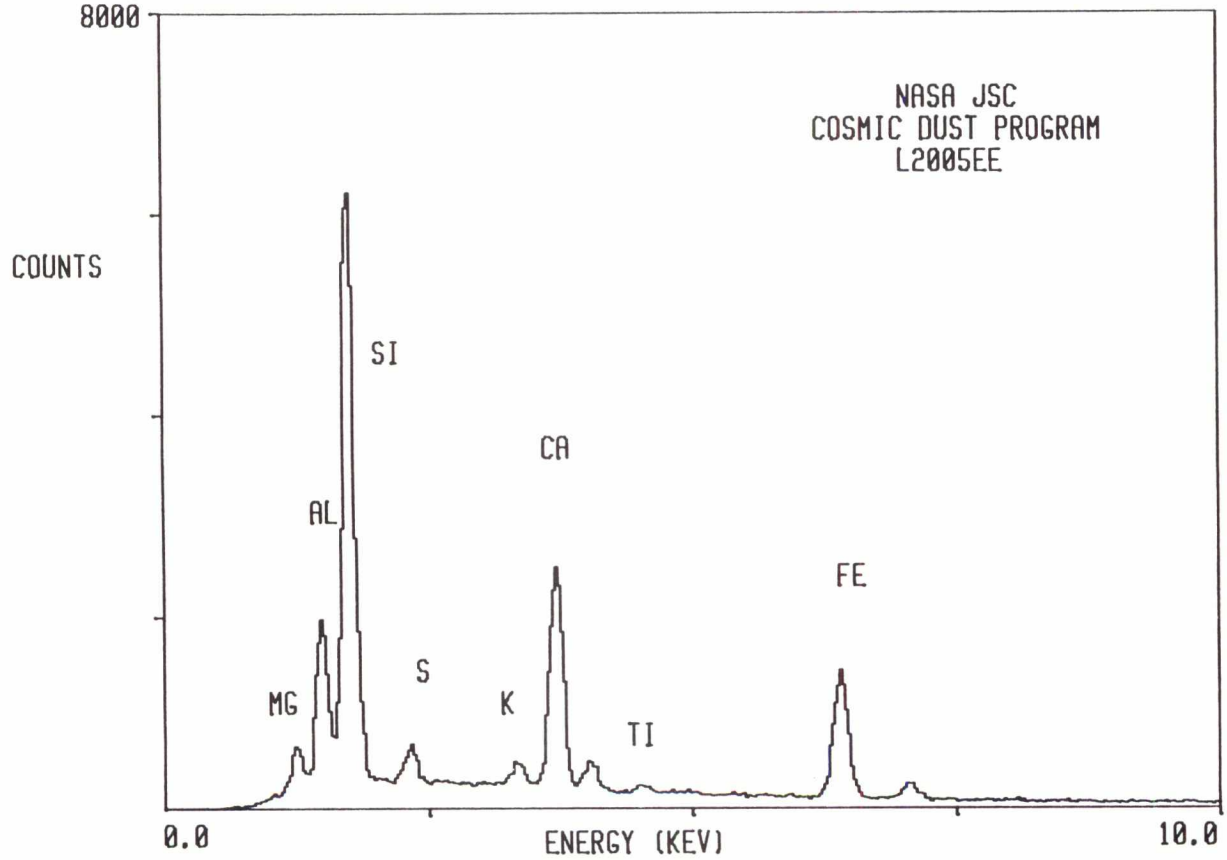
L2005 AE 5



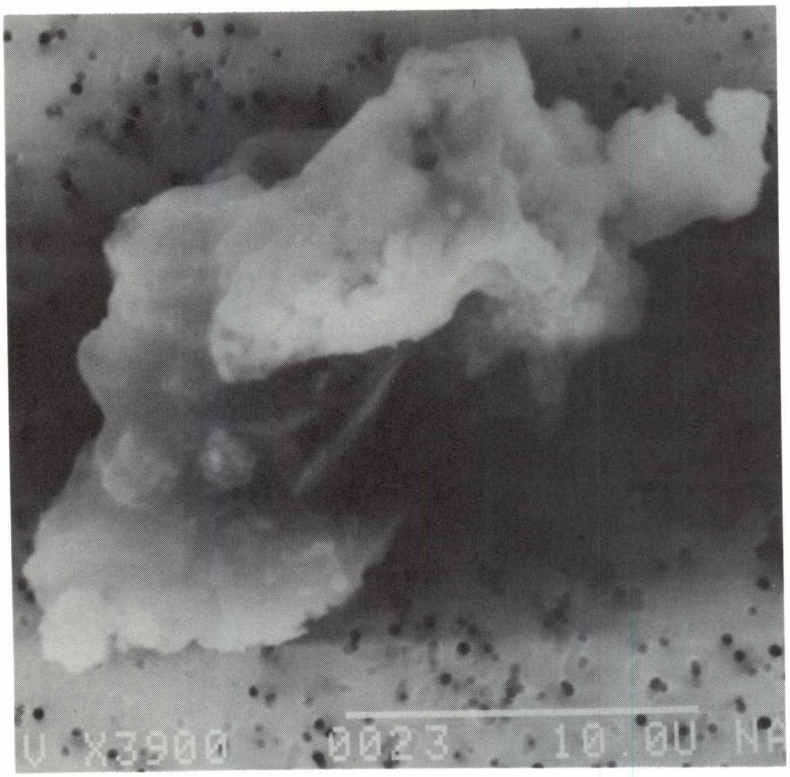
S-92-35890

SIZE: 24x17
SHAPE: I
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: TCN?

COMMENTS:



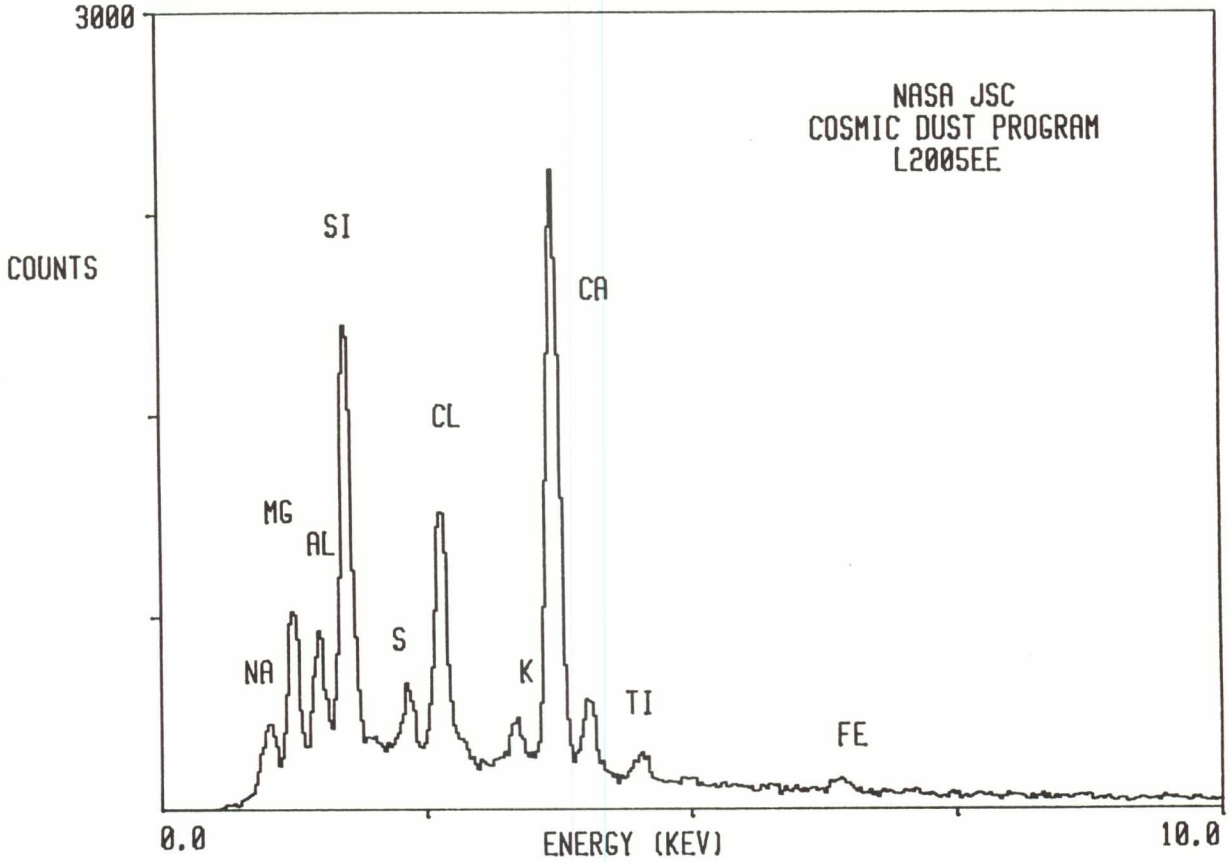
L2005 AE 10



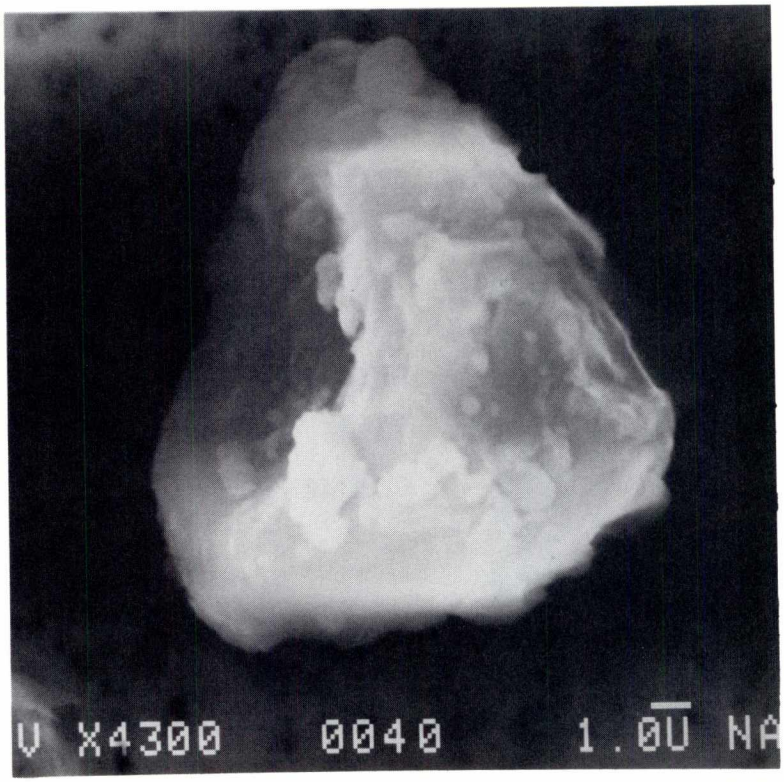
S-92-35895

SIZE: 28x11
SHAPE: I
TRANS.: TL
COLOR: White
LUSTER: V
TYPE: TCN?

COMMENTS:



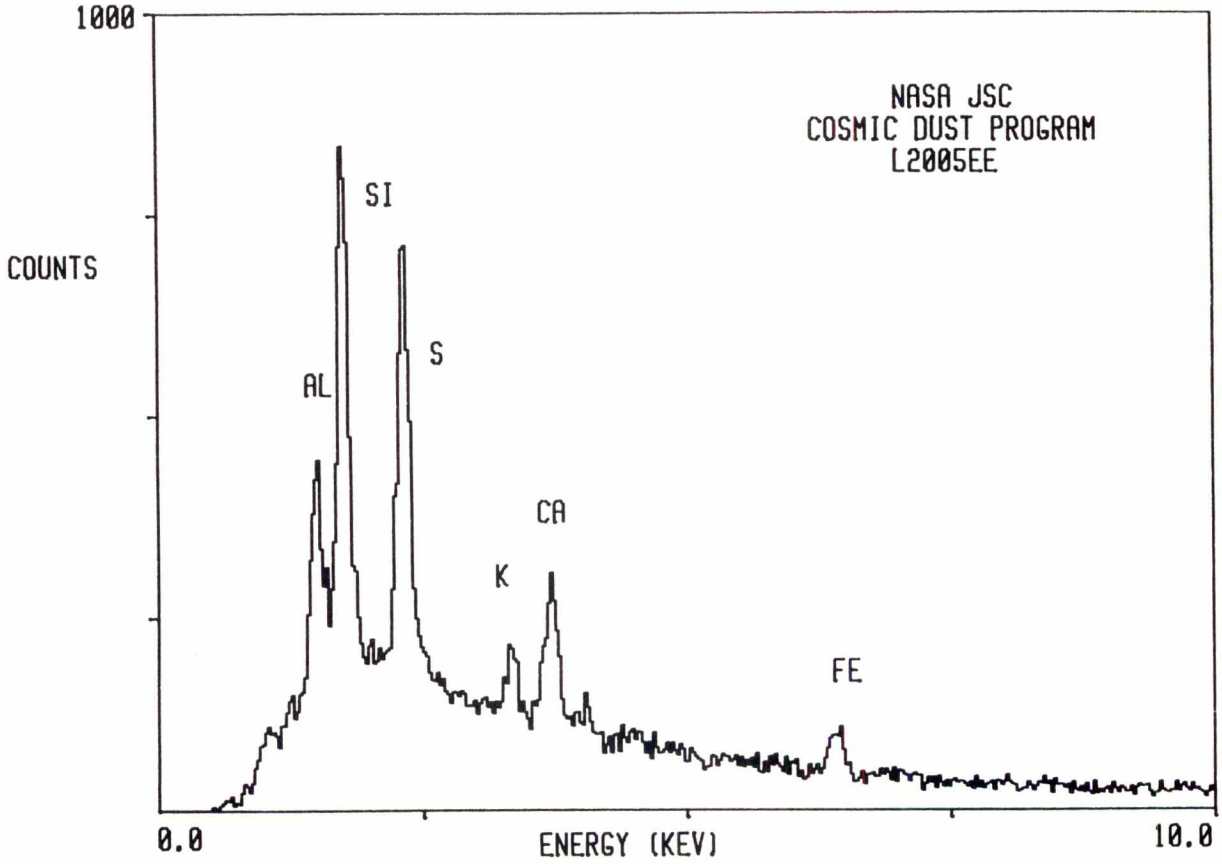
L2005 AE 16



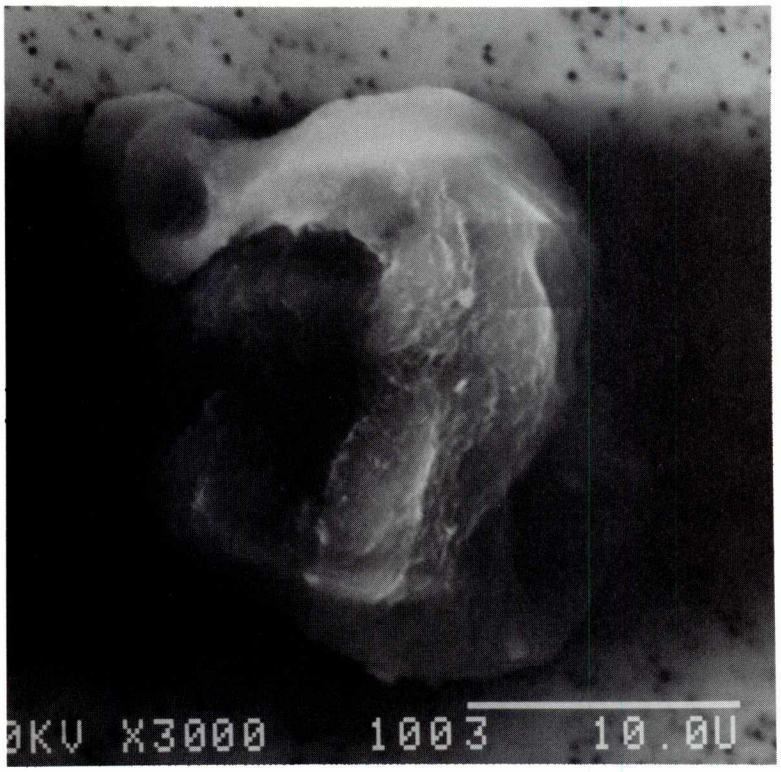
S-92-35900

SIZE: 15x14
SHAPE: E
TRANS.: O
COLOR: Brown
LUSTER: D
TYPE: TCN?

COMMENTS:



L2011 A 2



S-92-35883

SIZE: 24x22

SHAPE: E

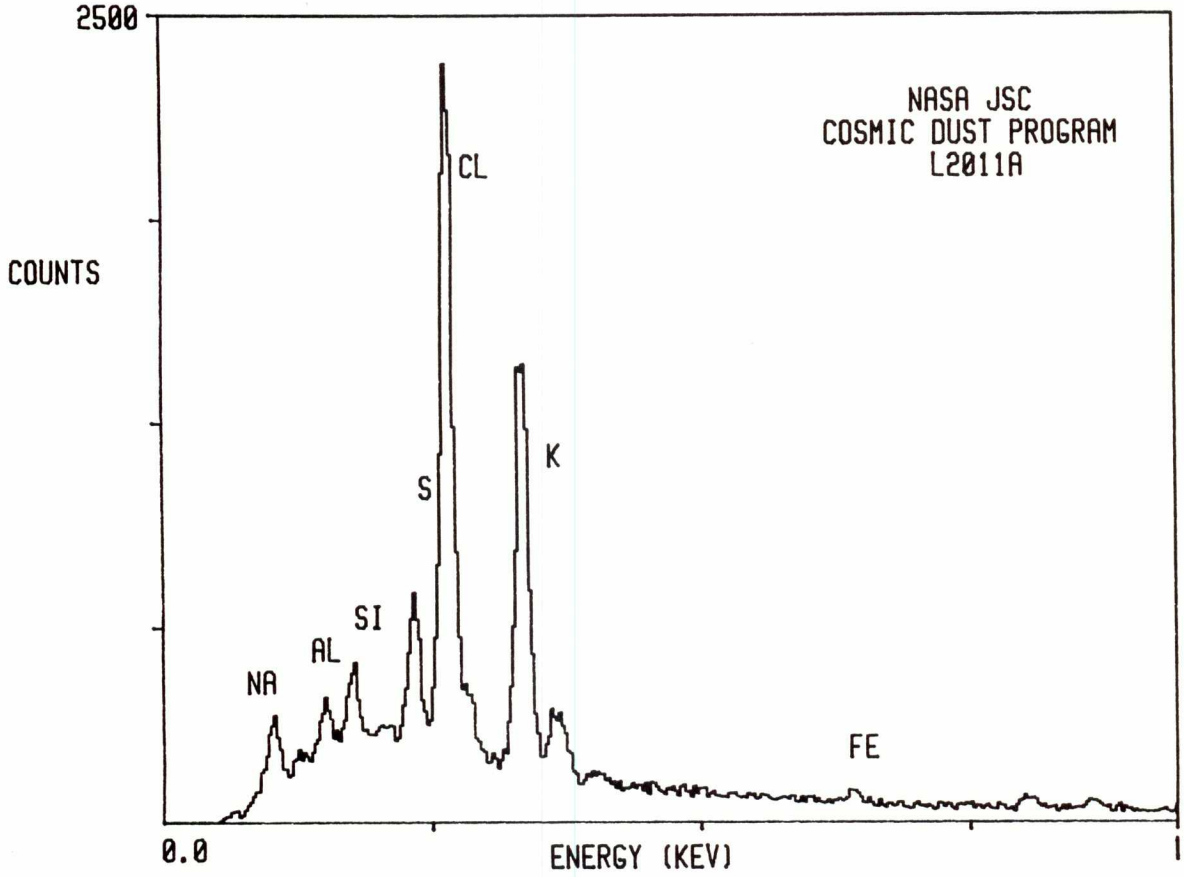
TRANS.: O

COLOR: White to Brown

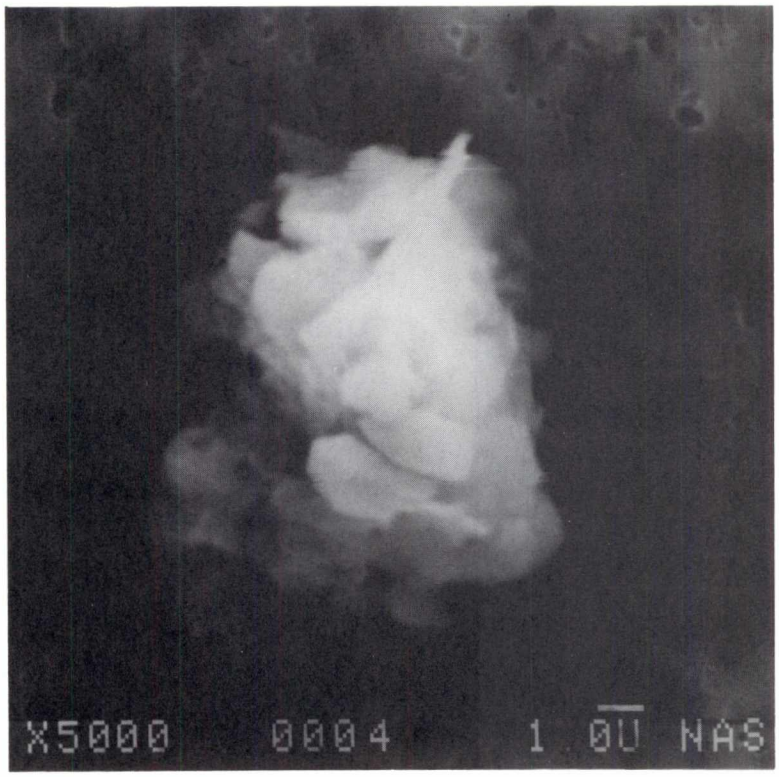
LUSTER: V

TYPE: TCN

COMMENTS:
From Cluster 2



L2011 D 1



S-92-35866

SIZE: 13x10

SHAPE: I

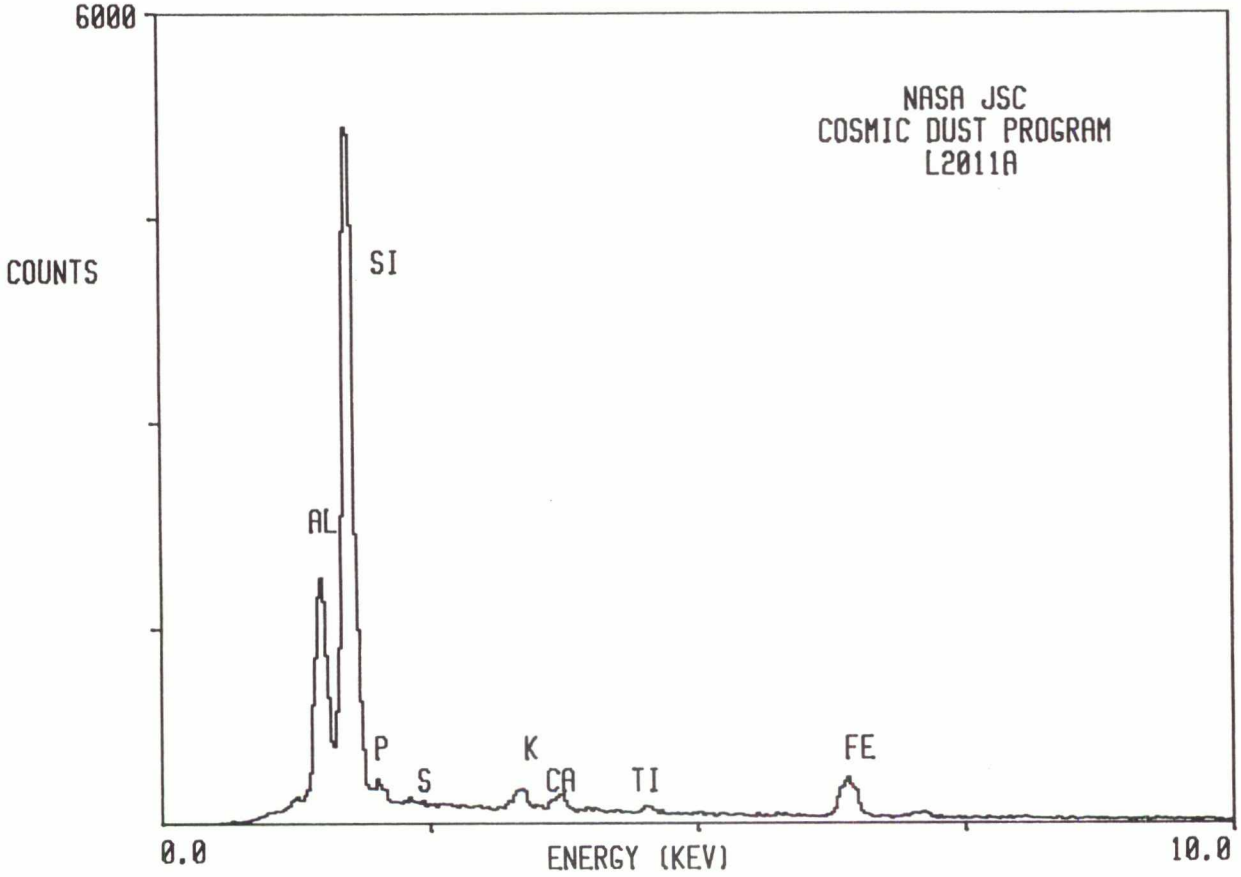
TRANS.: TL

COLOR: Black to White

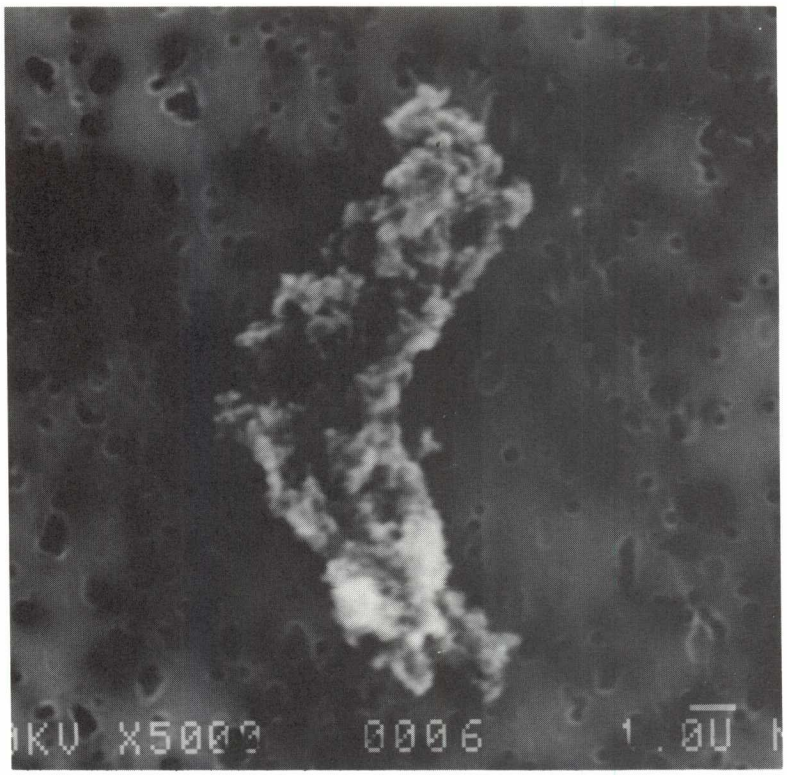
LUSTER: D

TYPE: TCN

COMMENTS:
Cluster 13



L2011 D 2



S-92-35867

SIZE: 12x4

SHAPE: I

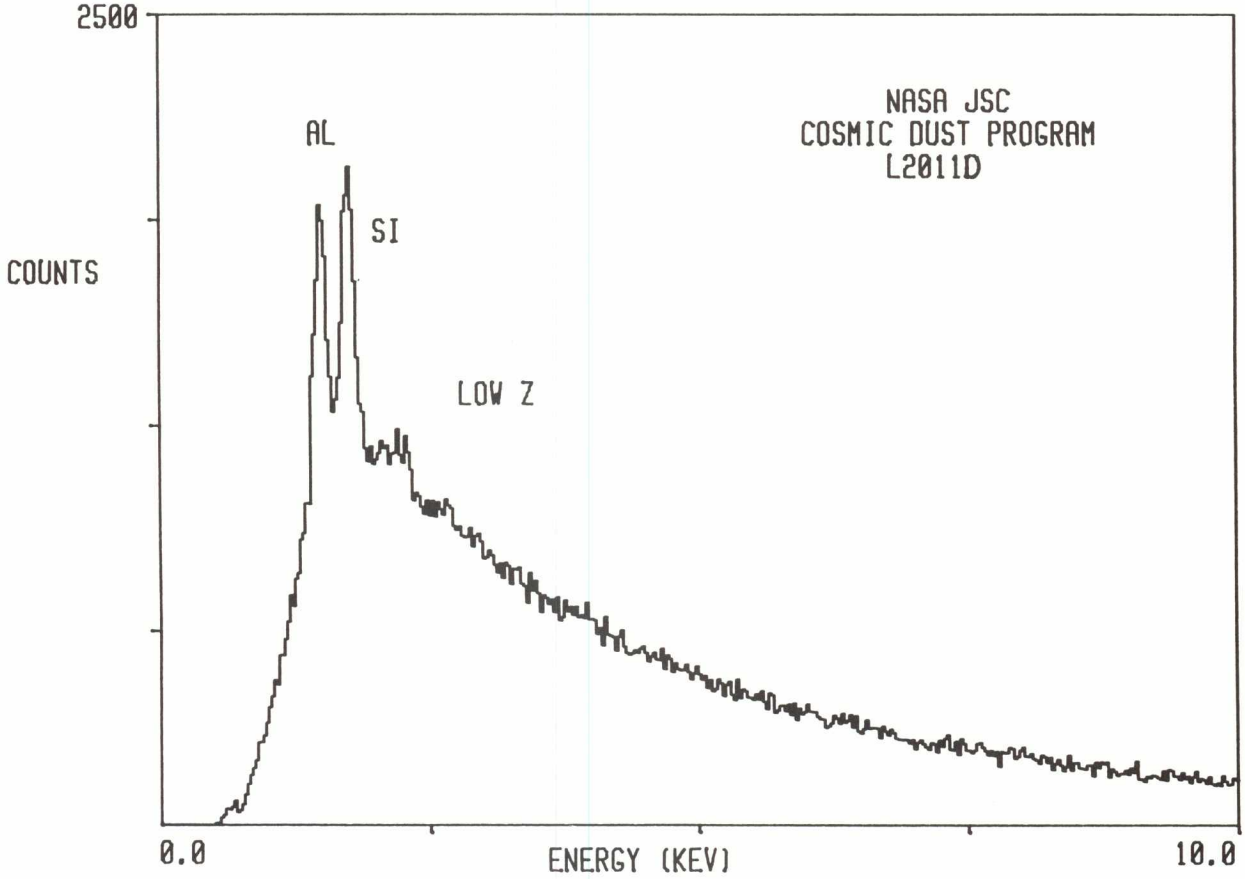
TRANS.: O

COLOR: Black

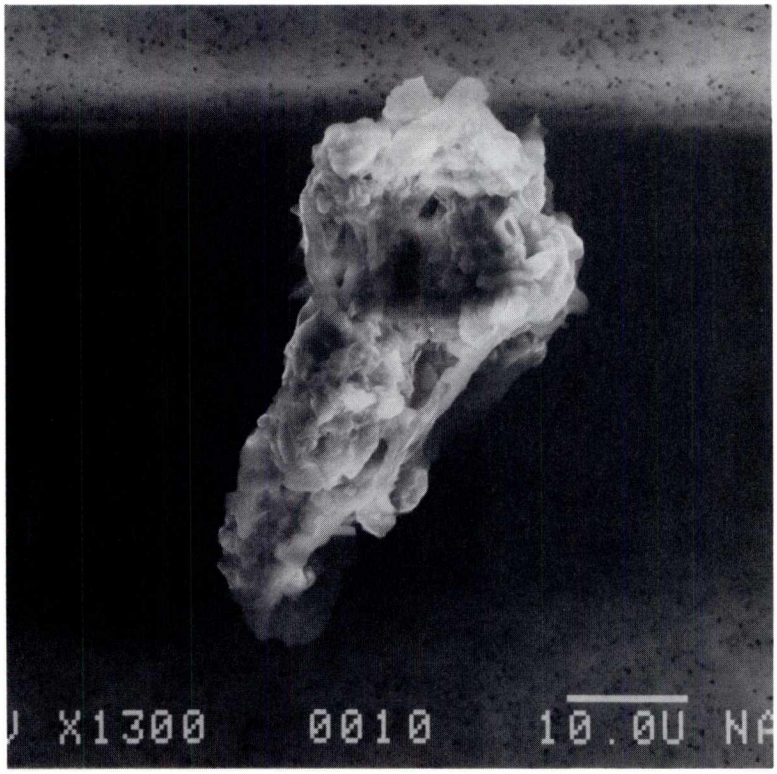
LUSTER: D

TYPE: TCN

COMMENTS:
Cluster 13



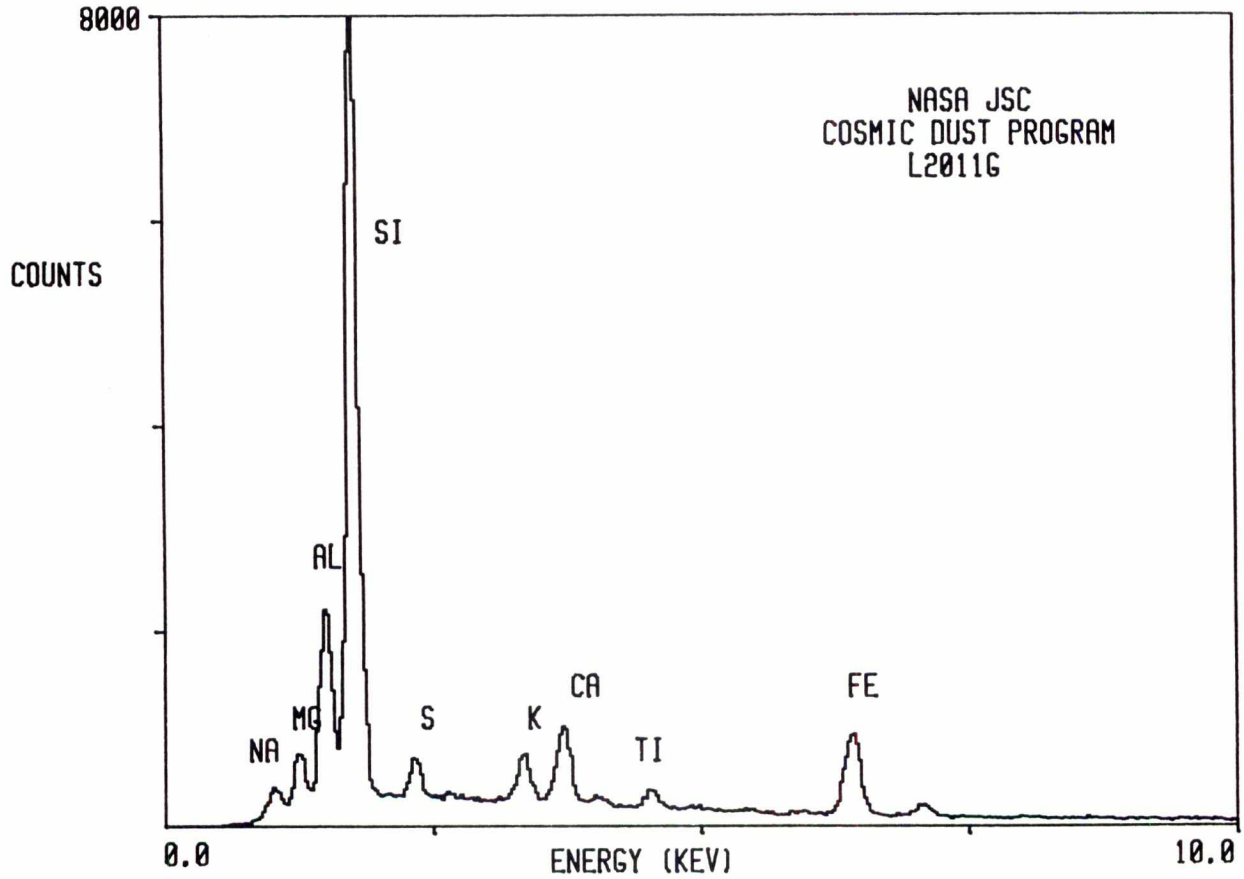
L2011 G 1



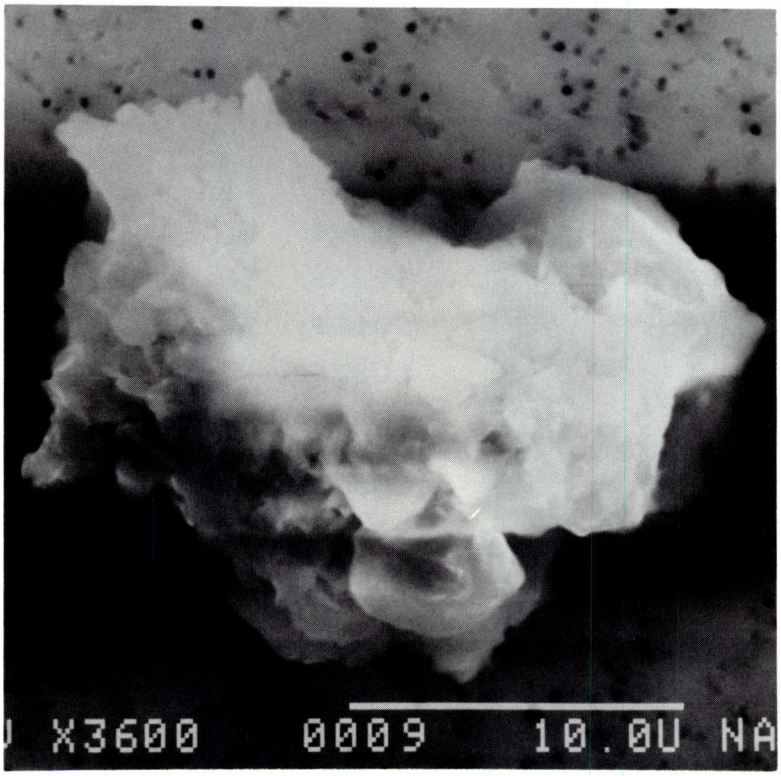
S-92-35844

SIZE: 50x28
SHAPE: I
TRANS.: O
COLOR: White
LUSTER: V
TYPE: TCN

COMMENTS:



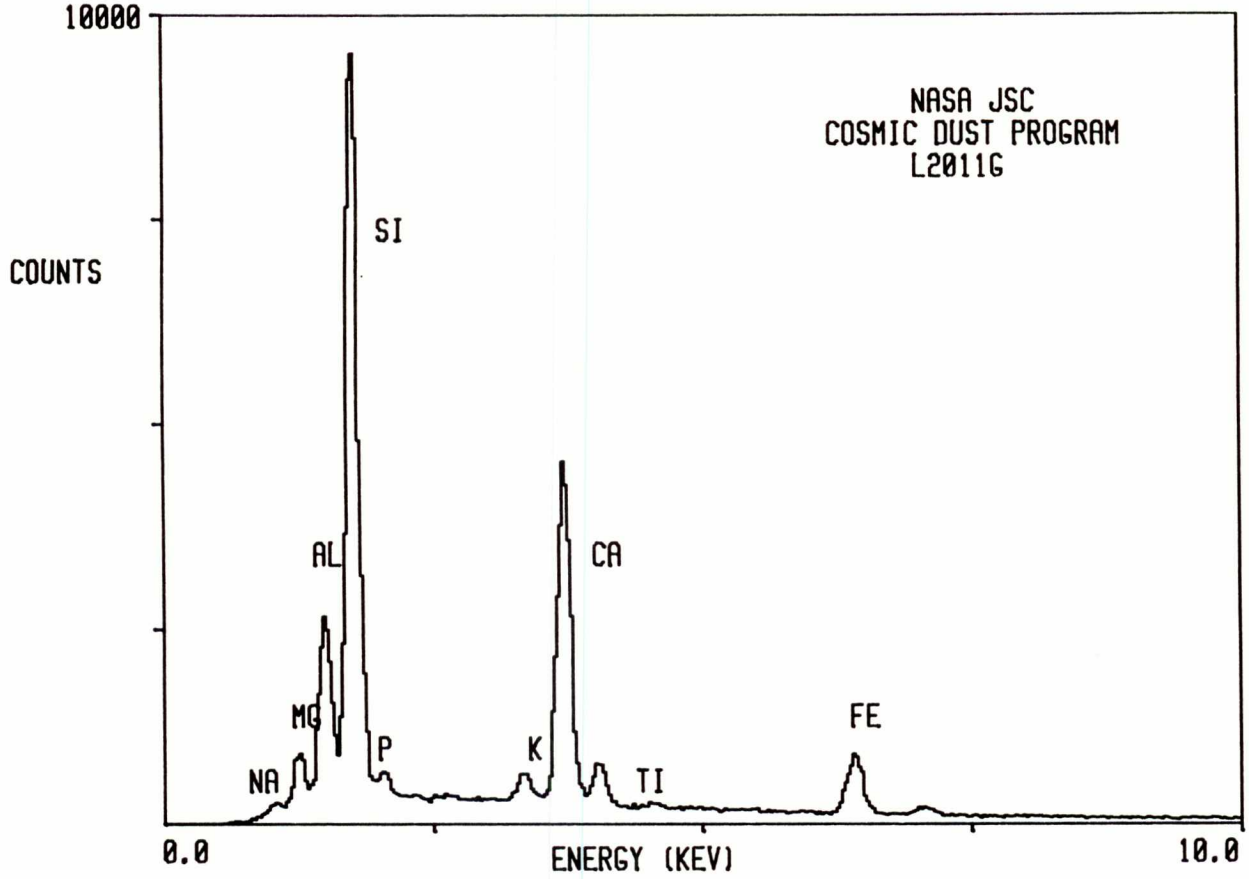
L2011 G 2



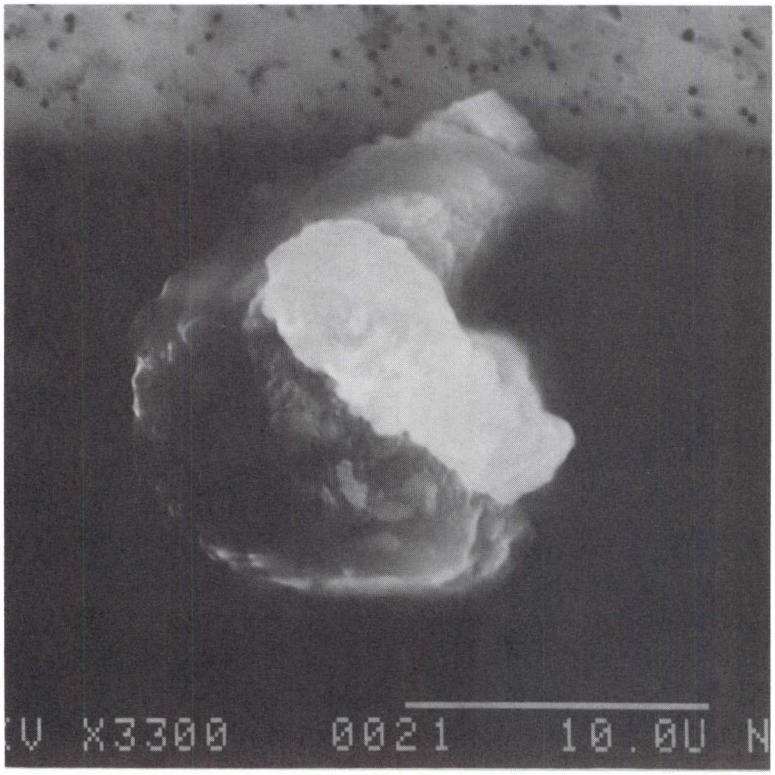
S-92-35845

SIZE: 24x16
SHAPE: I
TRANS.: O
COLOR: White
LUSTER: V
TYPE: TCN?

COMMENTS:



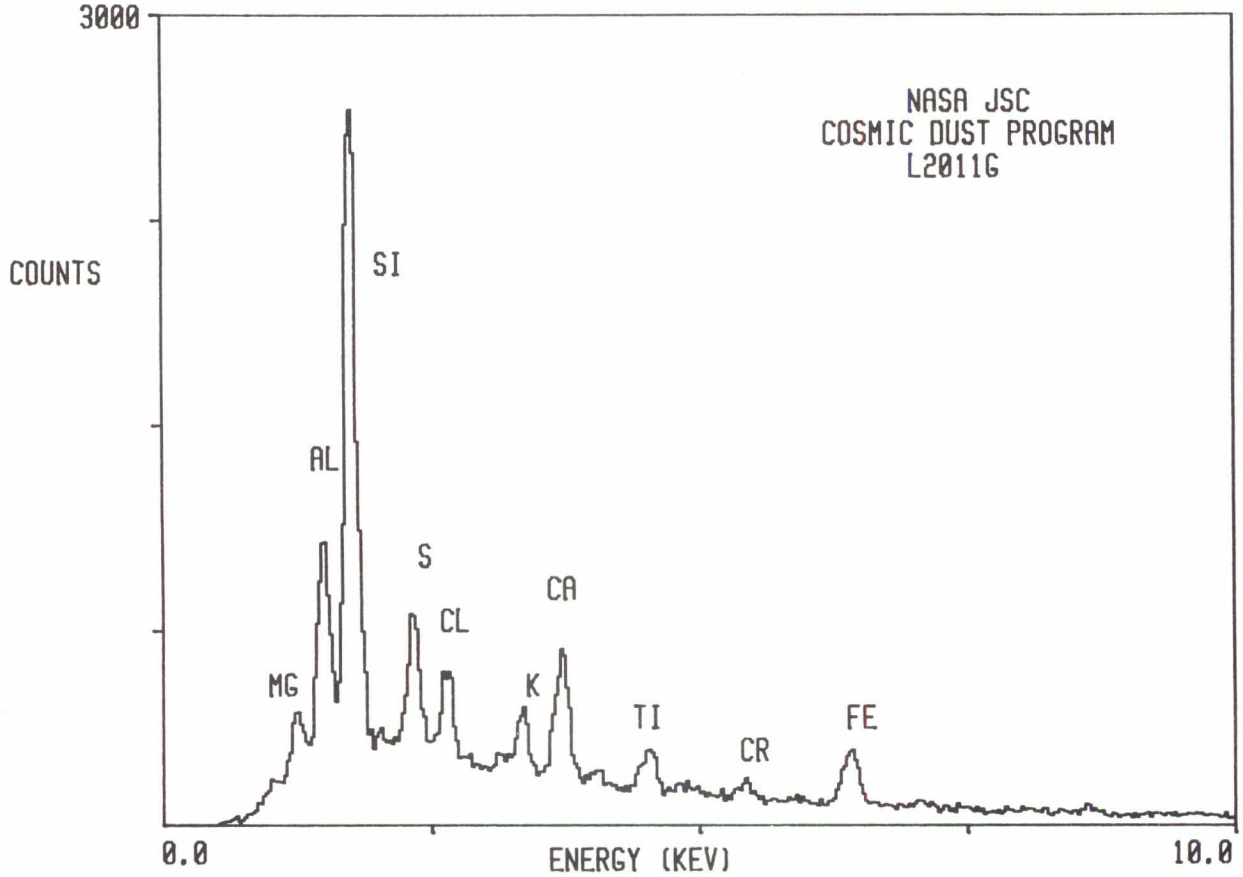
L2011 G 7



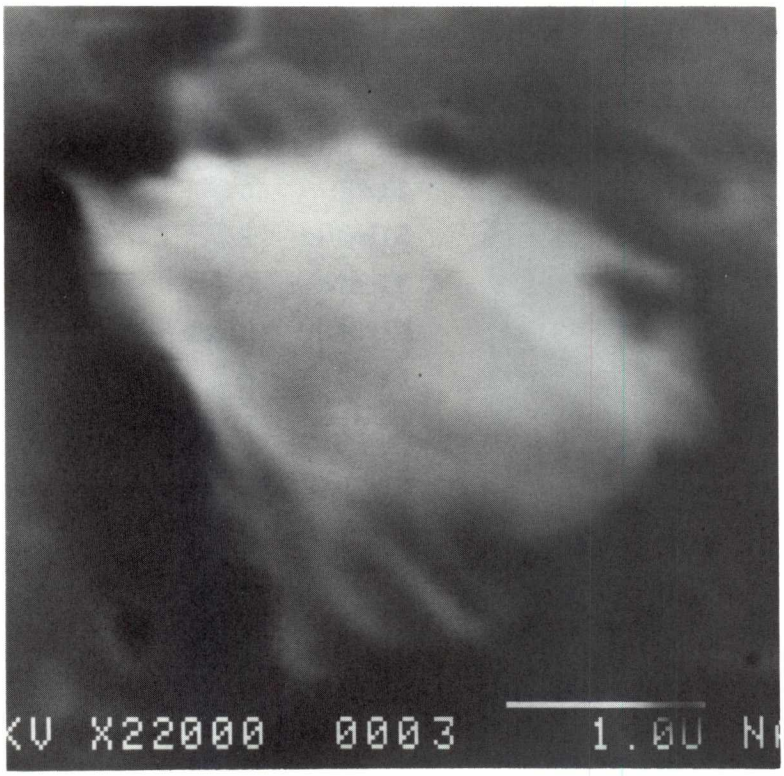
S-92-35850

SIZE: 20
SHAPE: E
TRANS.: TL
COLOR: White
LUSTER: V
TYPE: TCN

COMMENTS:



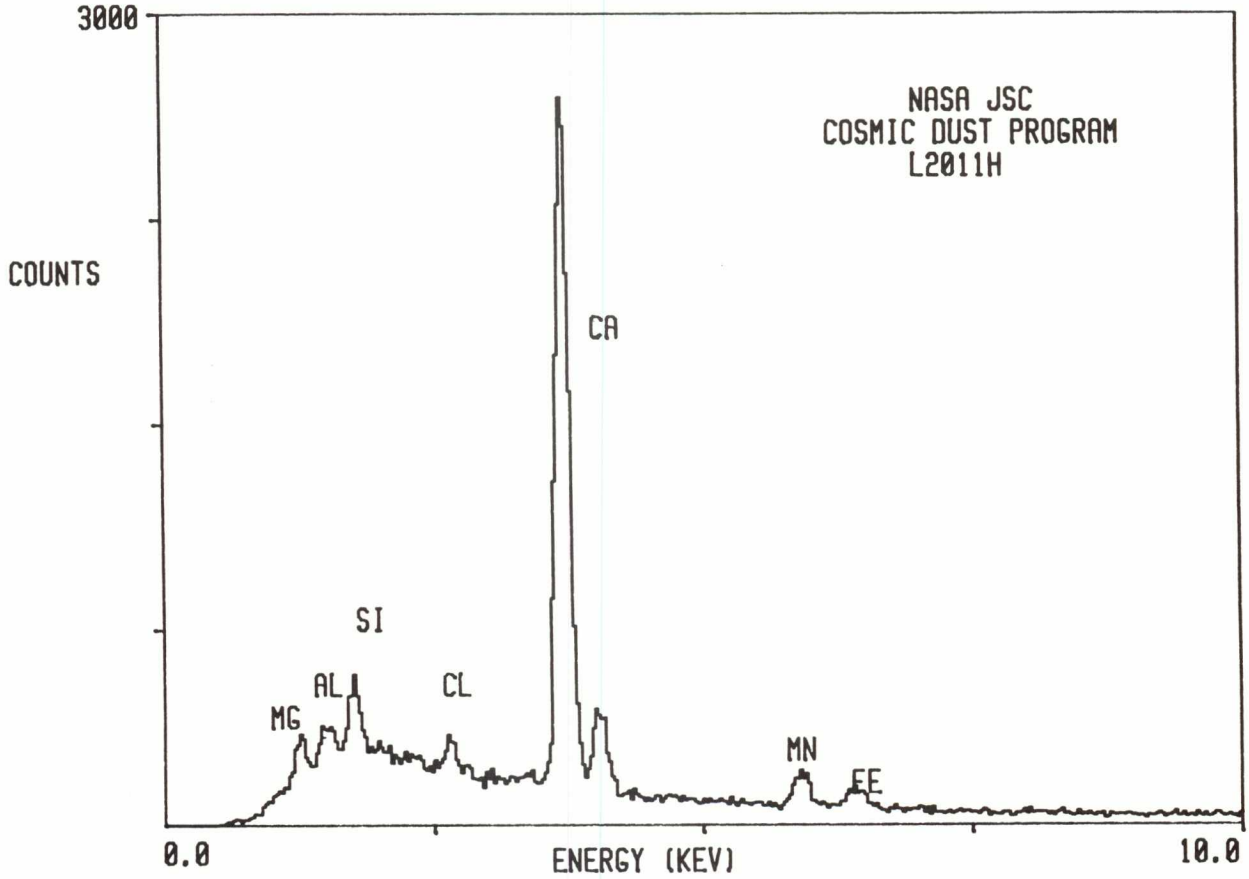
L2011 H 3



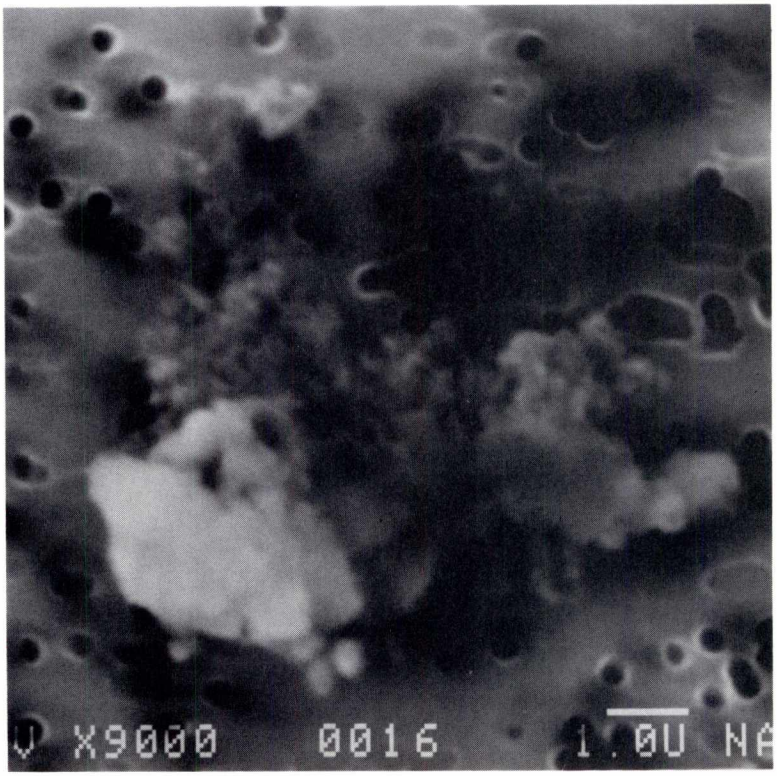
S-92-35833

SIZE: 3
SHAPE: E
TRANS.: T
COLOR: Colorless
LUSTER: V
TYPE: TCN

COMMENTS:



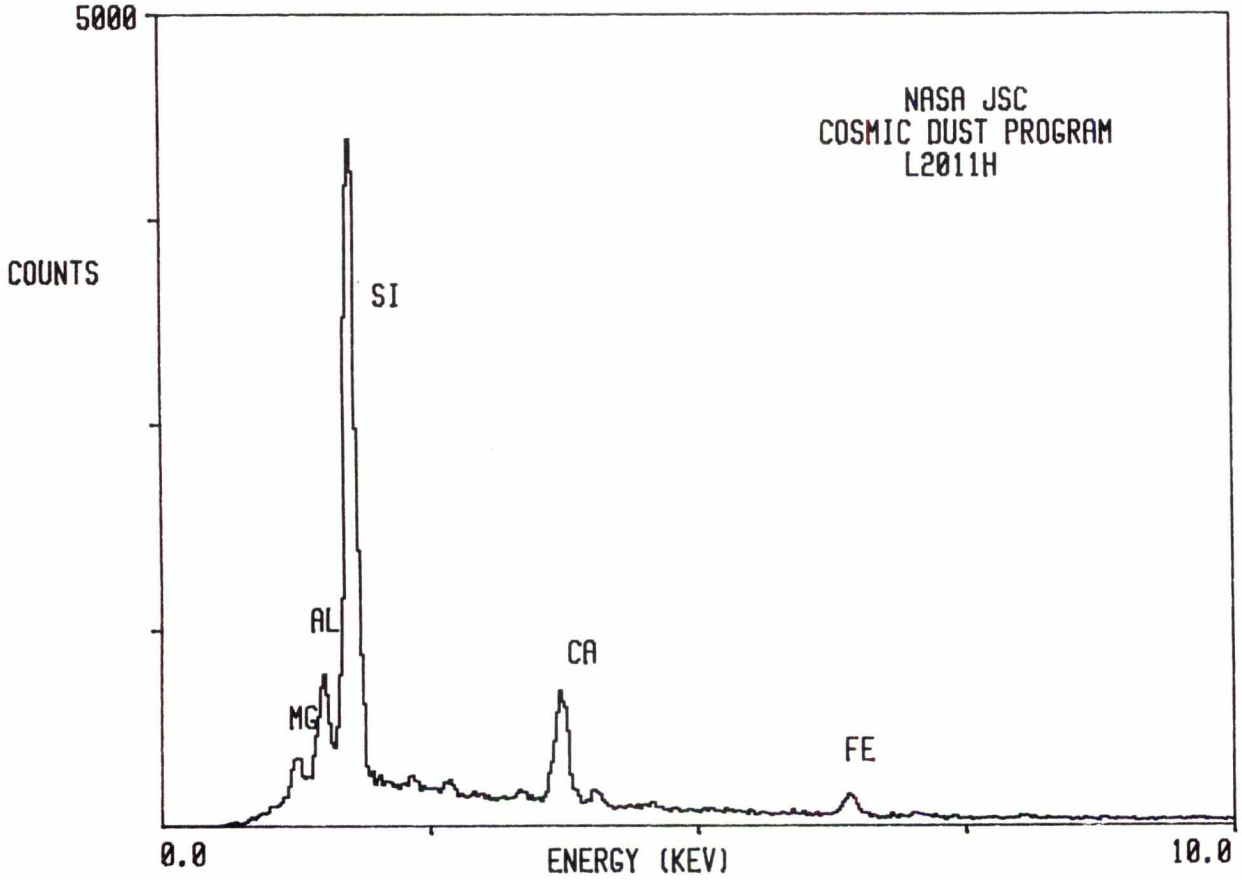
L2011 H 12



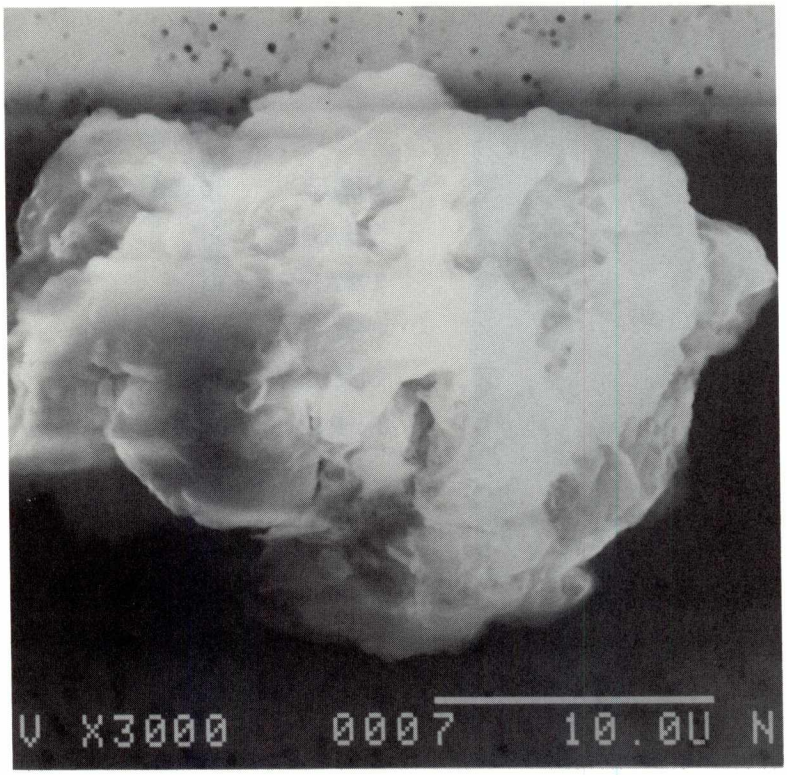
S-92-35842

SIZE: 6
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCN

COMMENTS:



L2011 J 3



S-92-35802

SIZE: 24

SHAPE: E

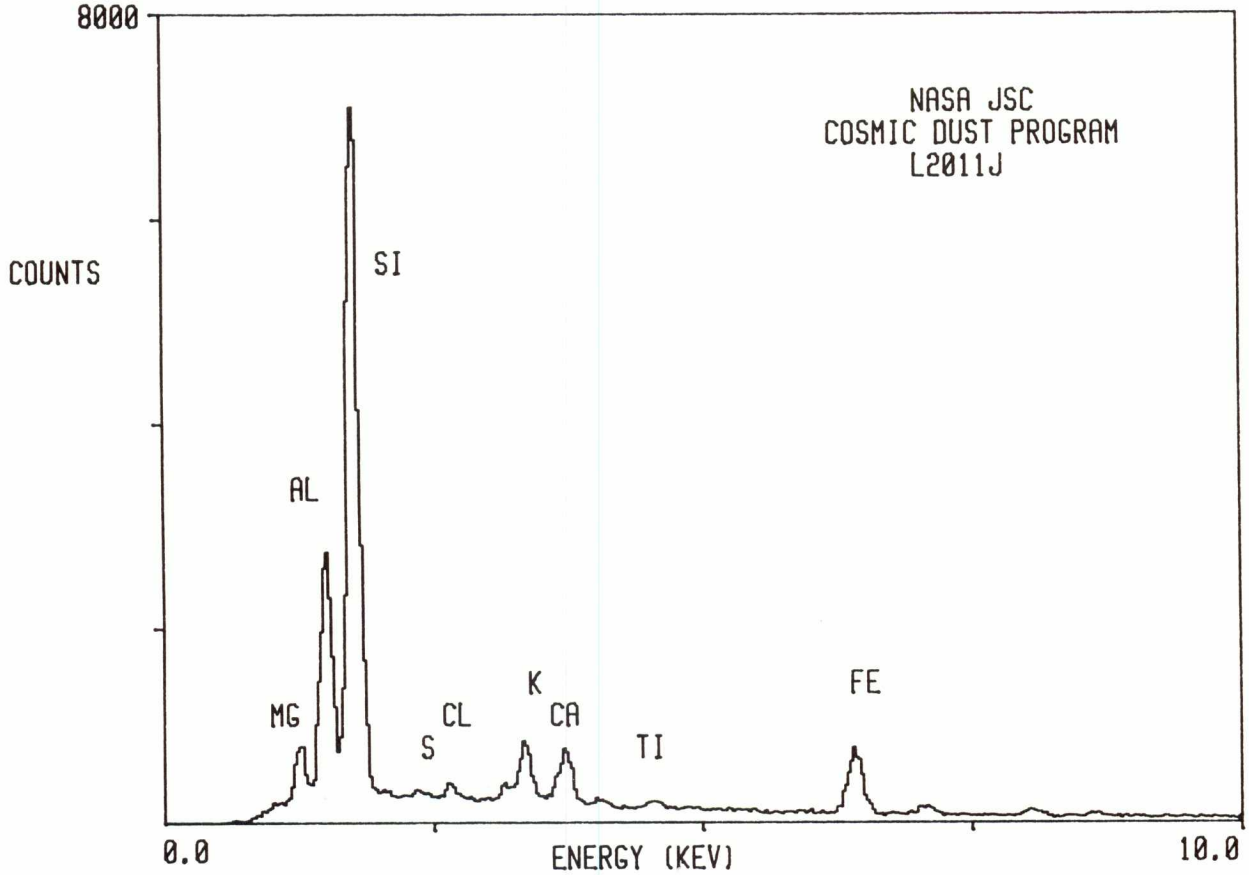
TRANS.: O

COLOR: White to Colorless

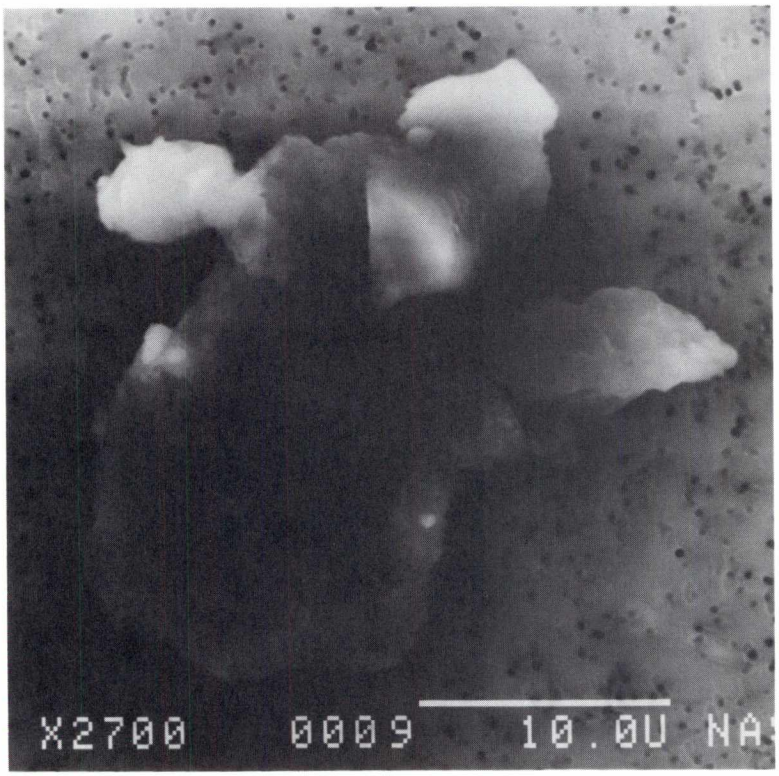
LUSTER: R/D

TYPE: TCN

COMMENTS:



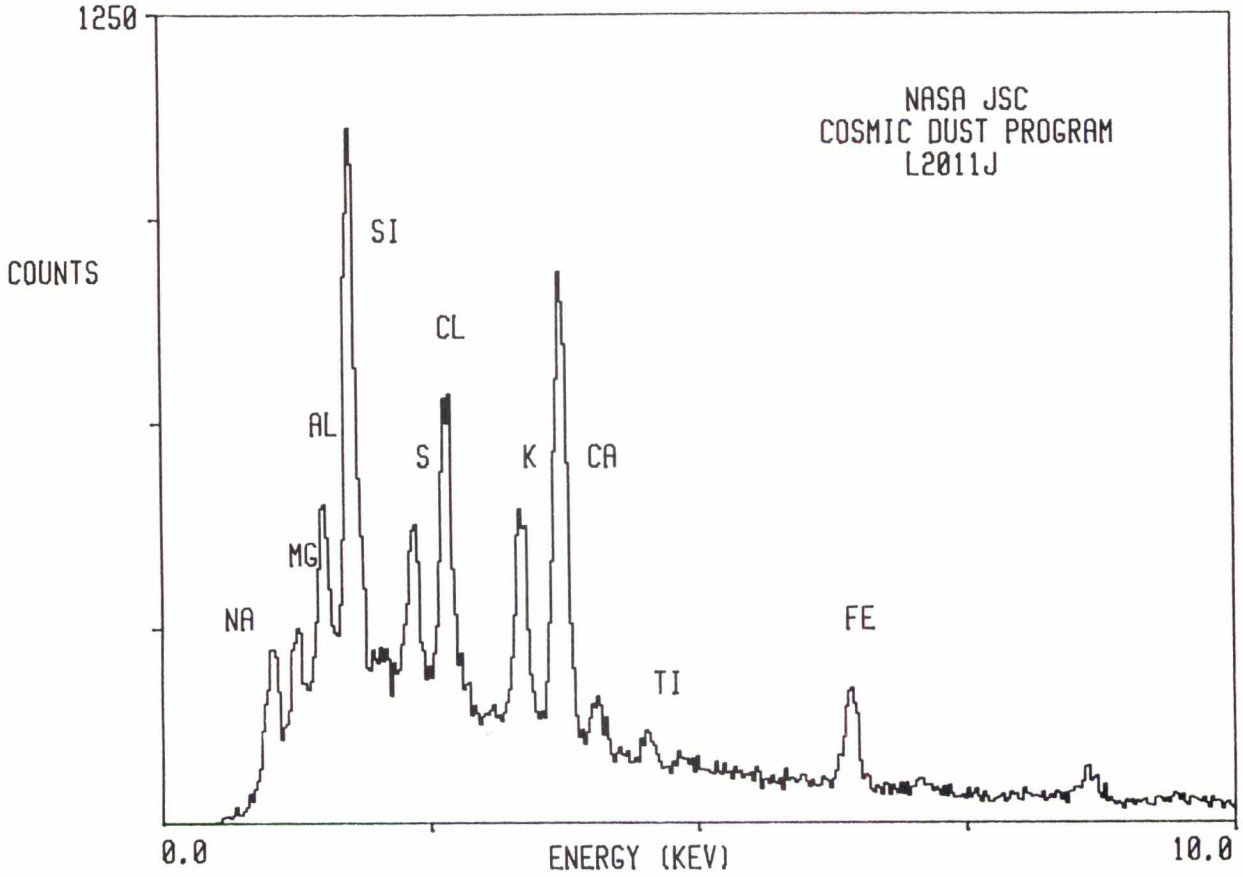
L2011 J 4



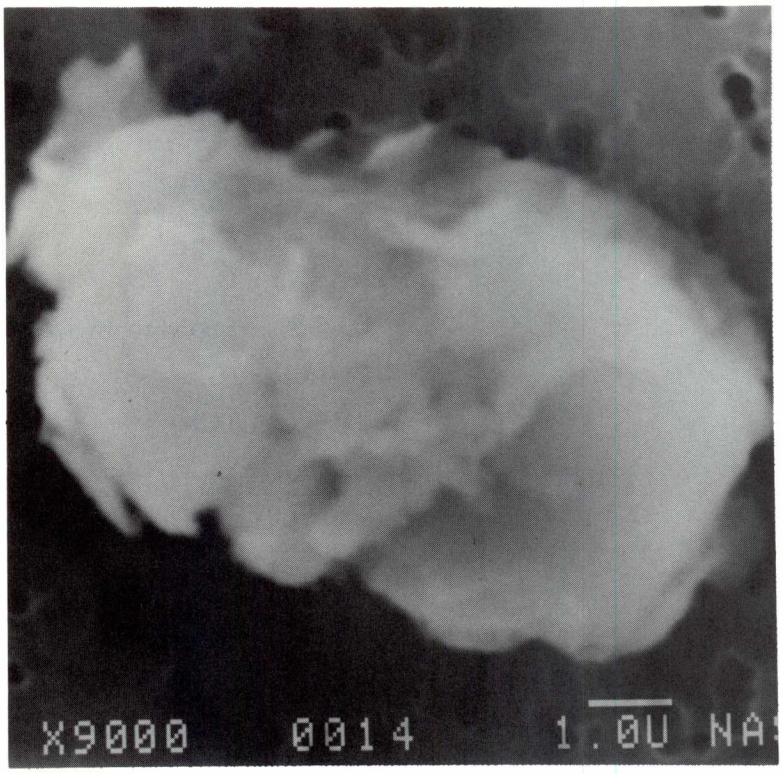
S-92-35803

SIZE: 30x26
SHAPE: E
TRANS.: TL
COLOR: White
LUSTER: R
TYPE: TCN

COMMENTS:



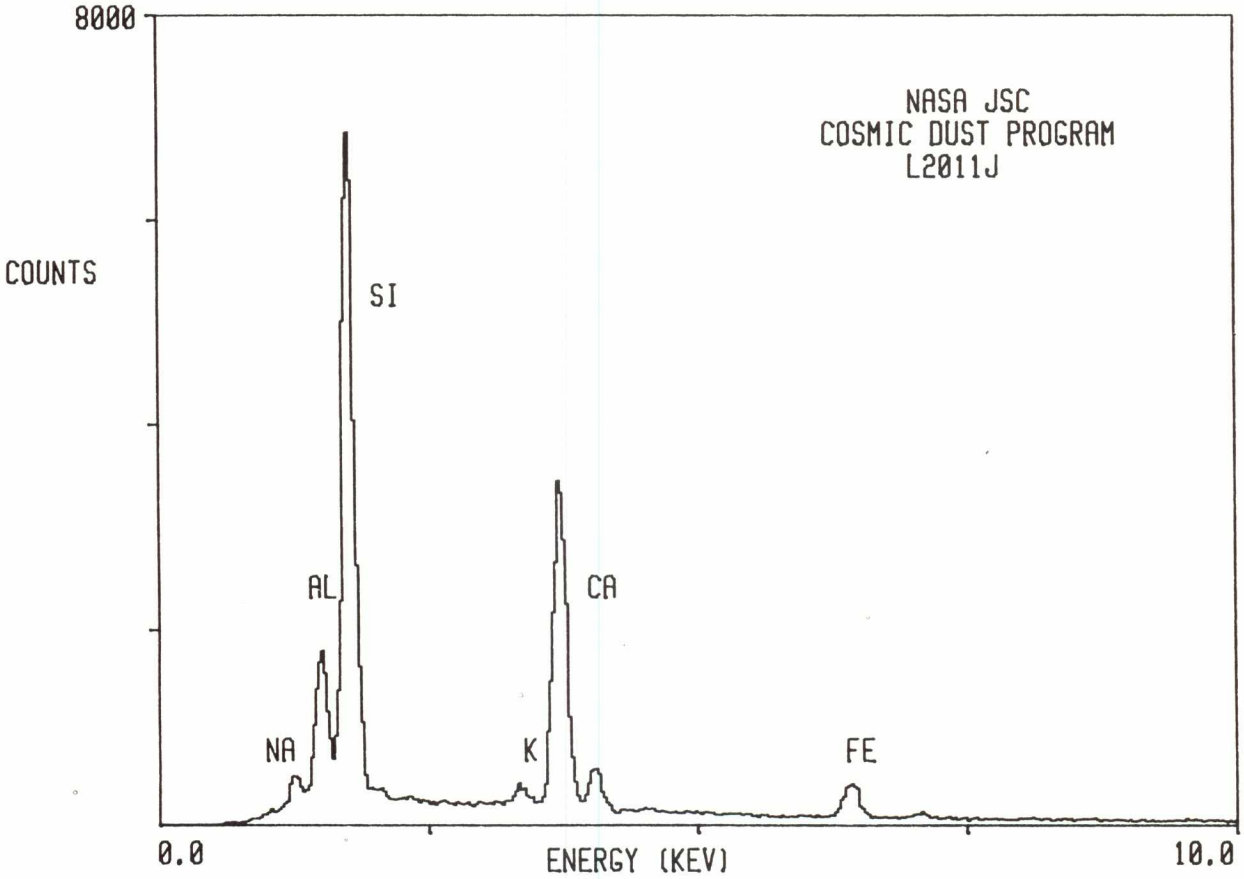
L2011 J 7



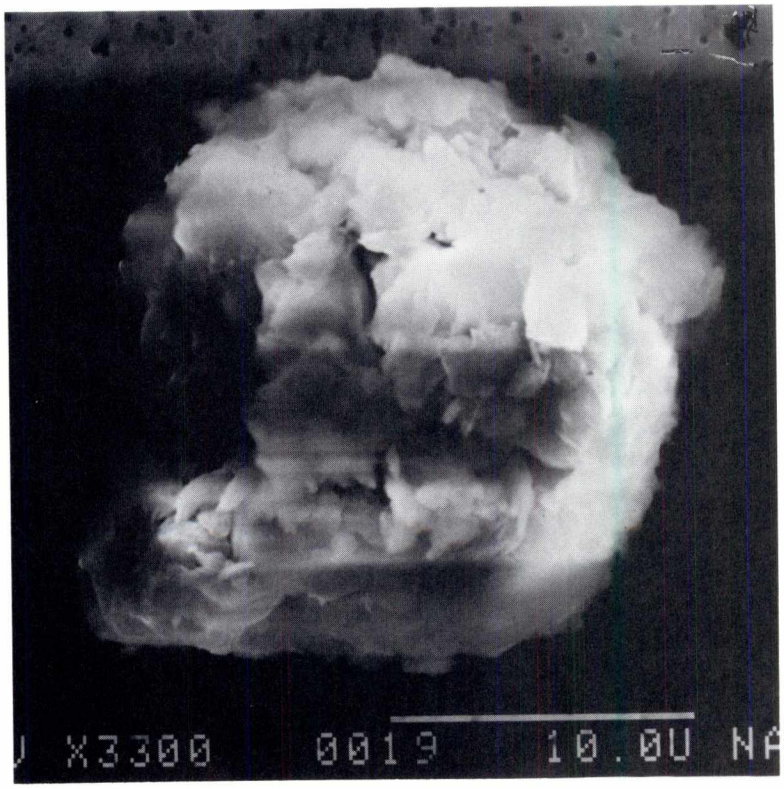
S-92-35806

SIZE: 9x6
SHAPE: I
TRANS.: TL
COLOR: White
LUSTER: V
TYPE: TCN?

COMMENTS:



L2011 J 9



S-92-35808

SIZE: 34x22

SHAPE: I

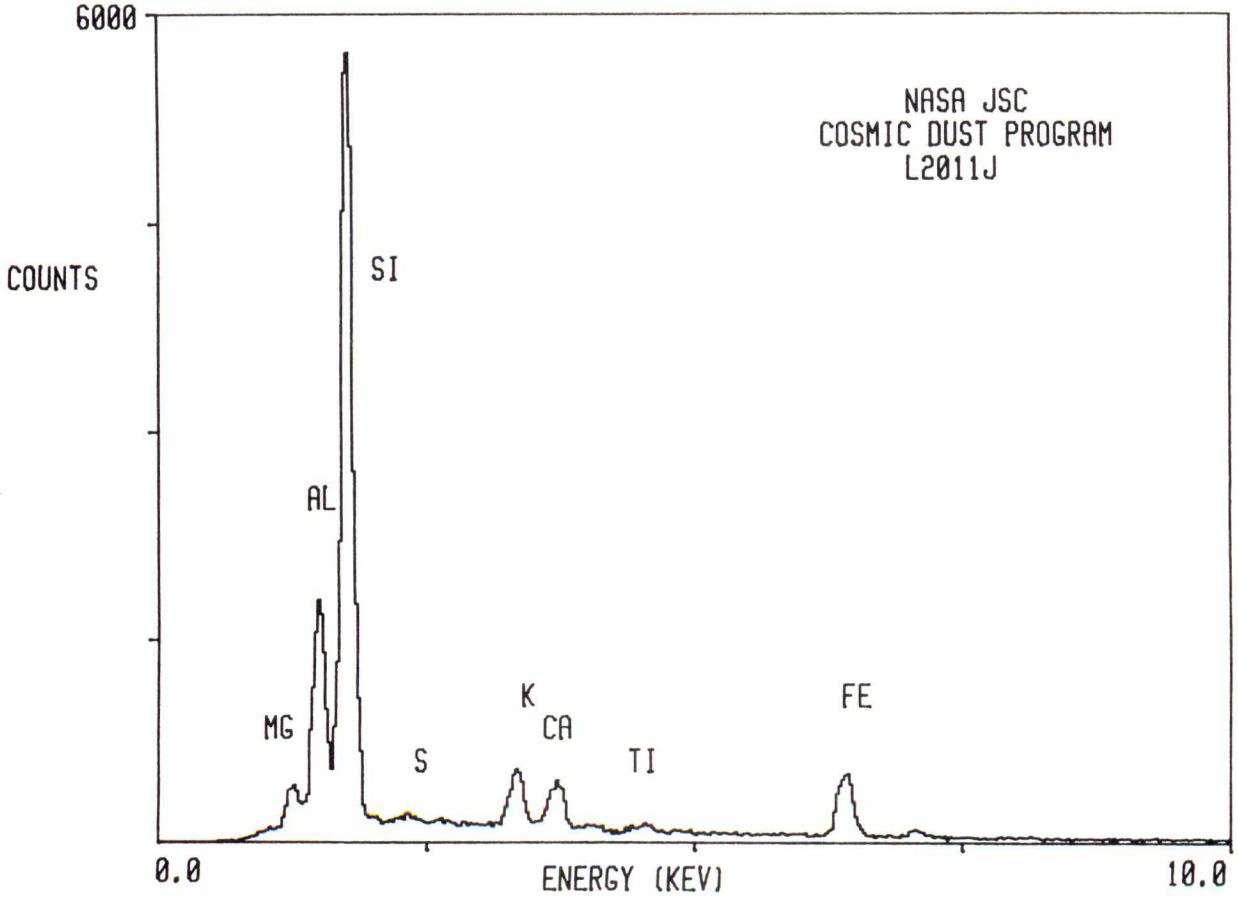
TRANS.: O

COLOR: Black to Brown

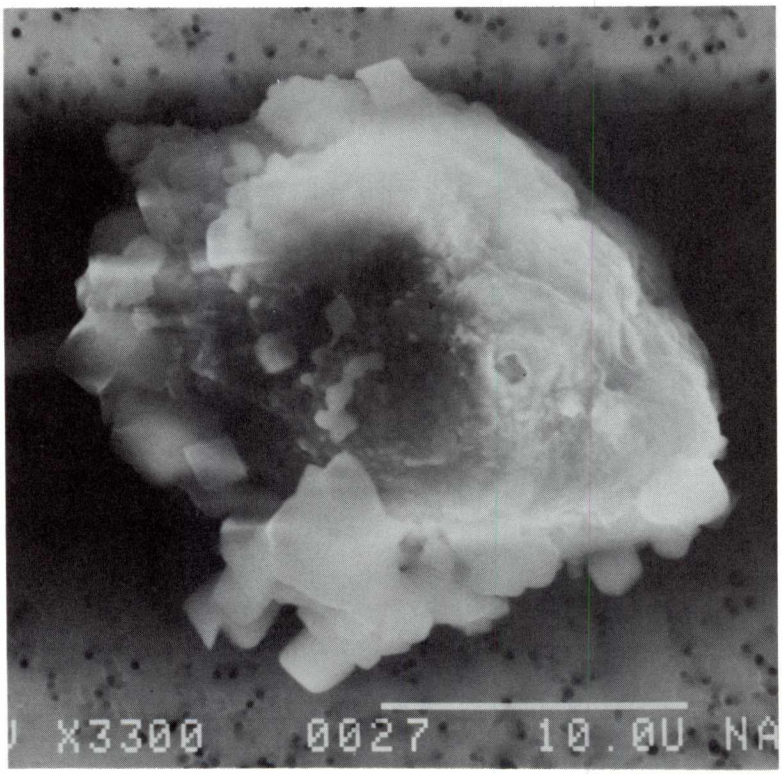
LUSTER: R

TYPE: TCN

COMMENTS:



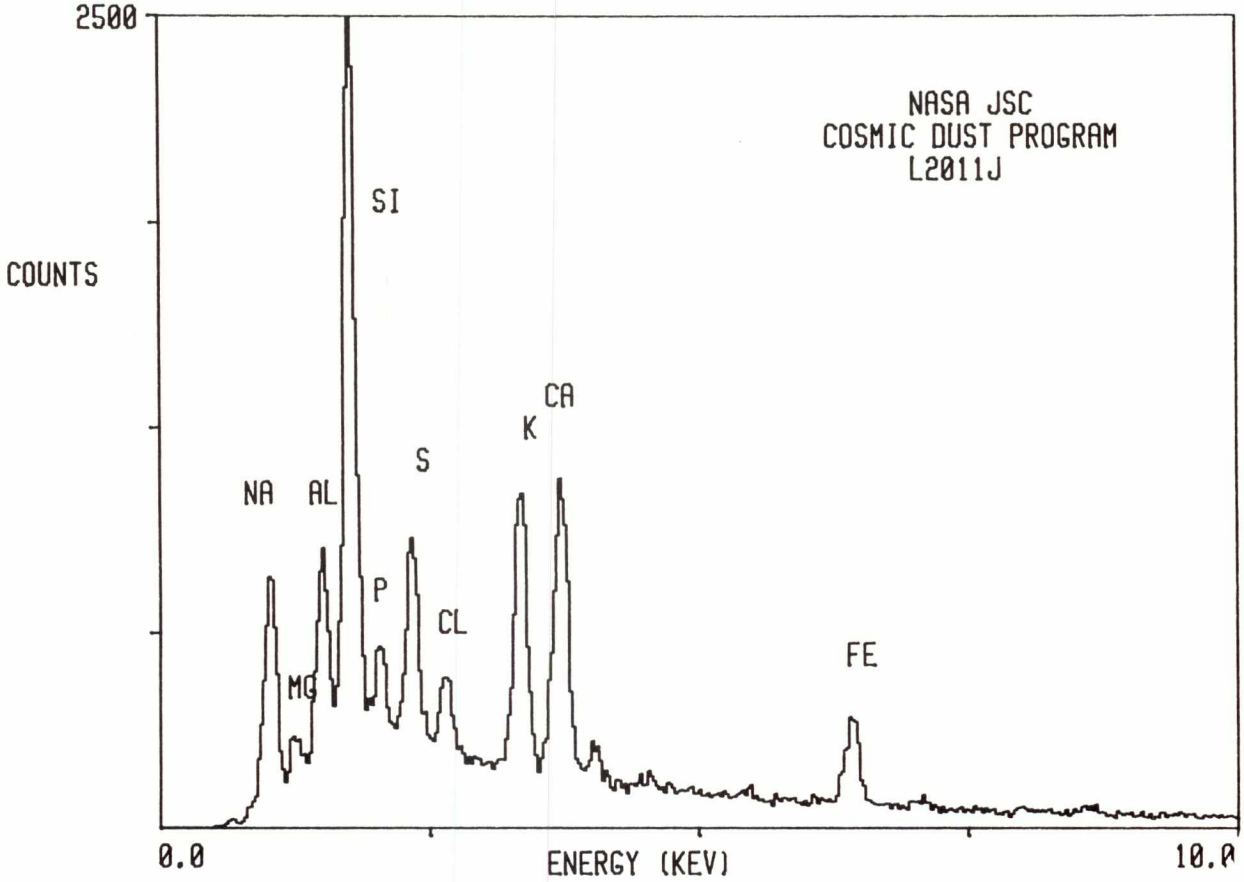
L2011 J 11



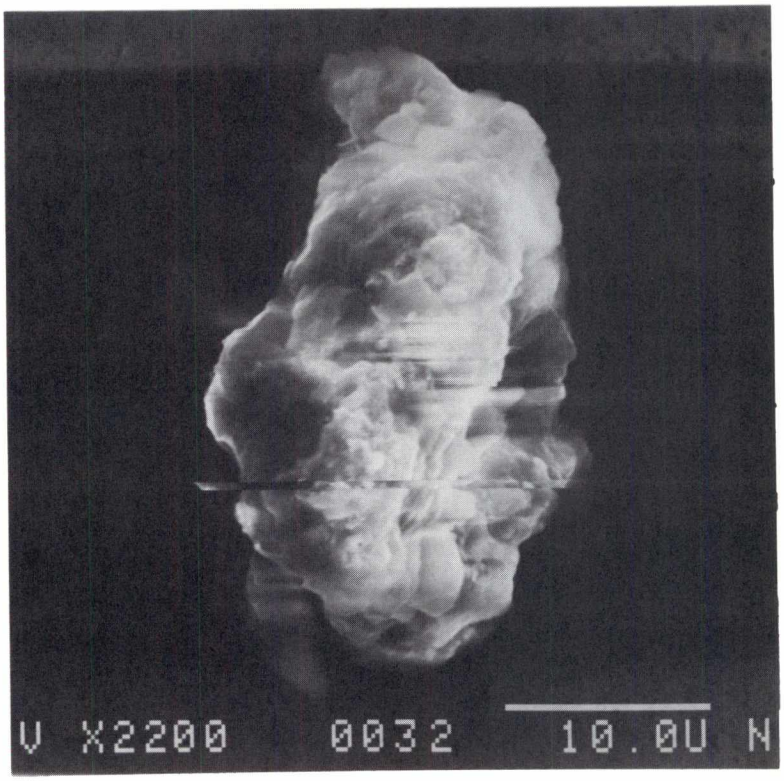
S-92-35810

SIZE: 24x20
SHAPE: E
TRANS.: O
COLOR: Brown
LUSTER: R/M
TYPE: TCN

COMMENTS:



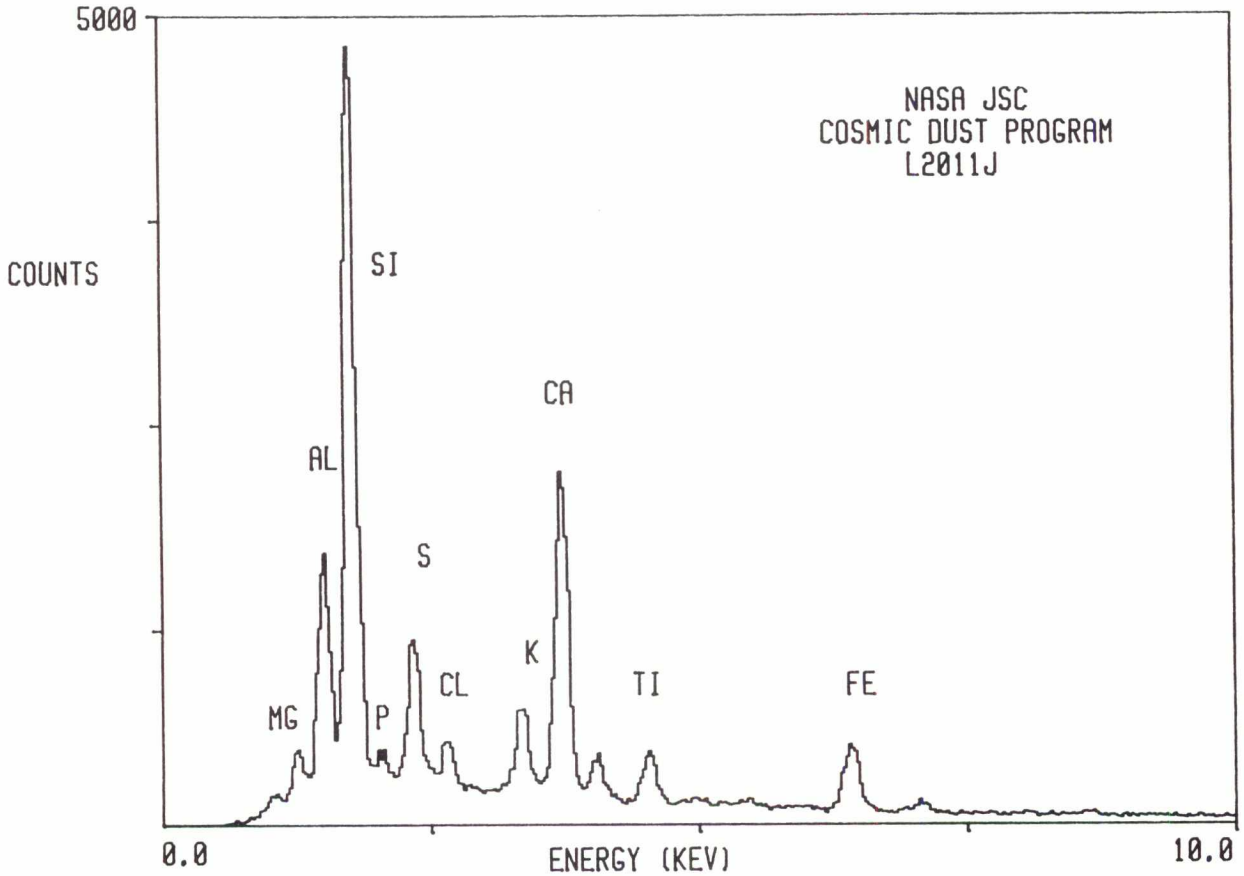
L2011 J 12



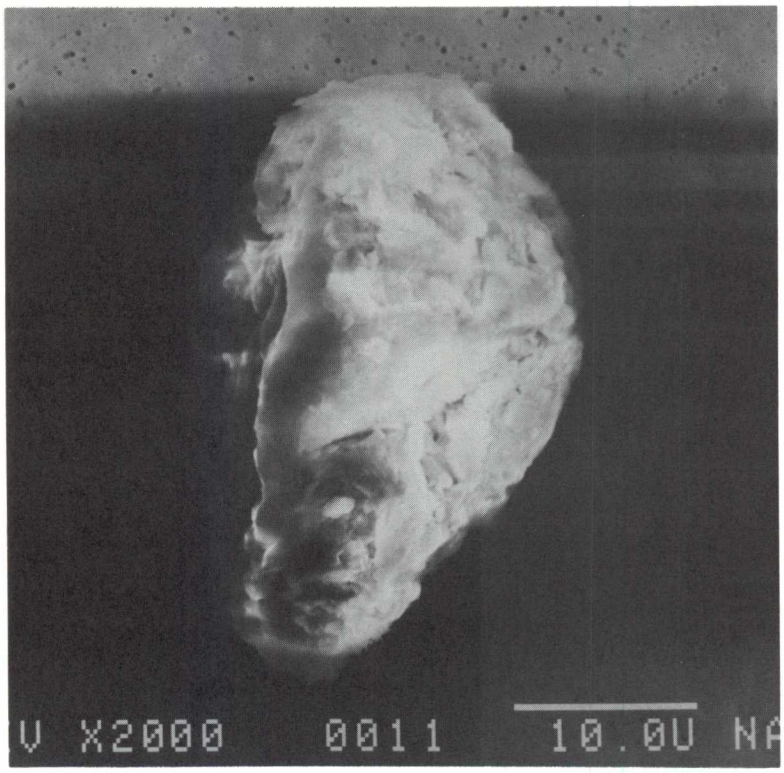
S-92-35811

SIZE: 30x20
SHAPE: E
TRANS.: TL
COLOR: White
LUSTER: V
TYPE: TCN

COMMENTS:



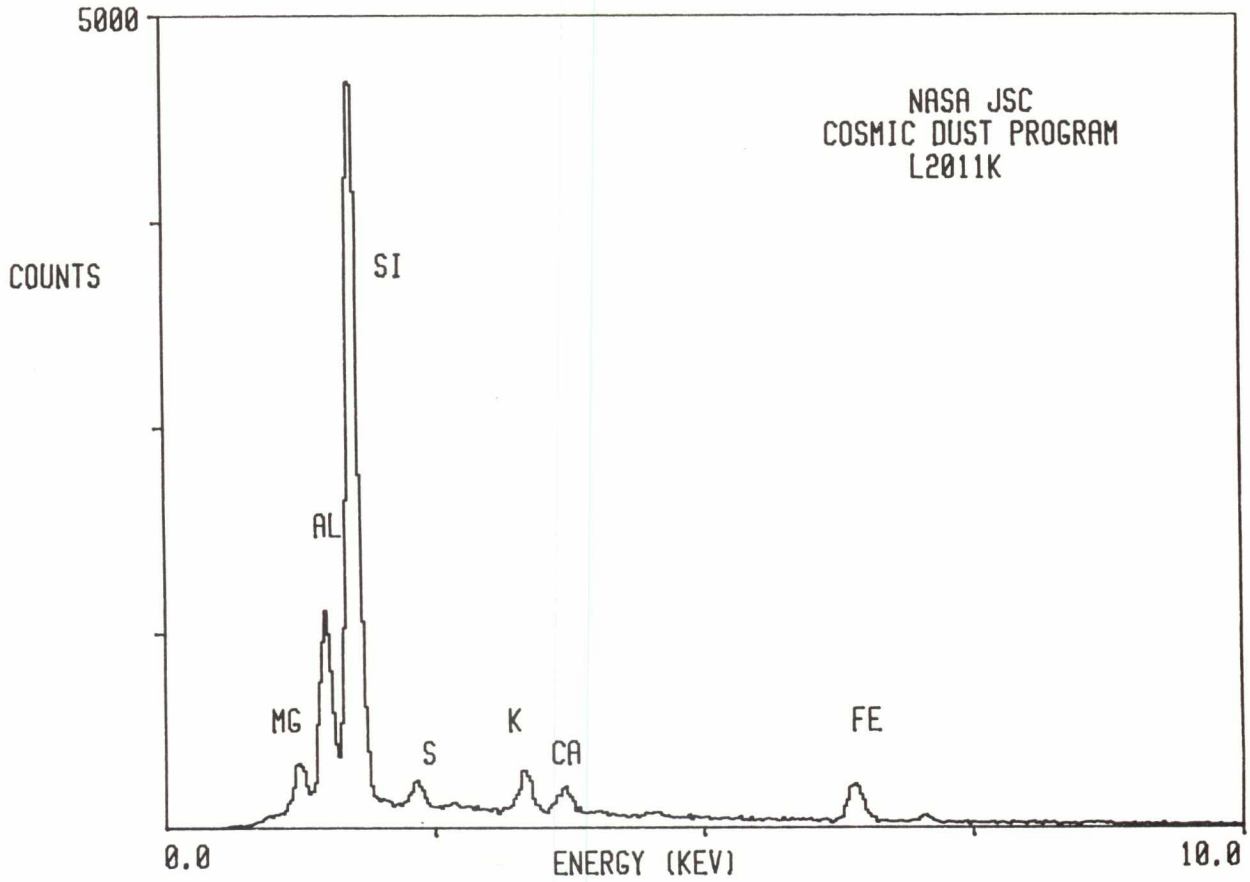
L2011 K 2



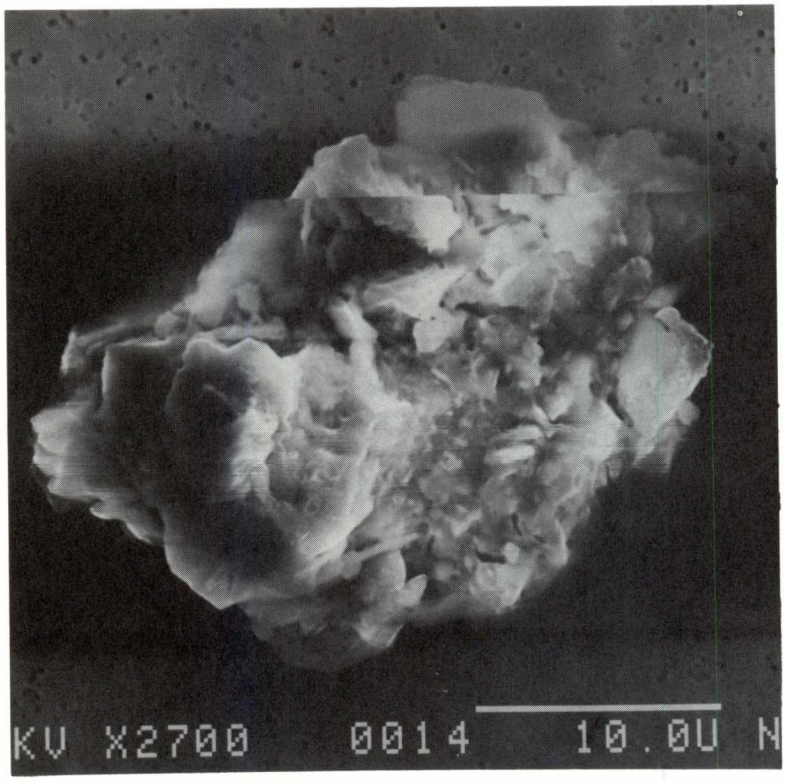
S-92-35784

SIZE: 36x26
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCN

COMMENTS:



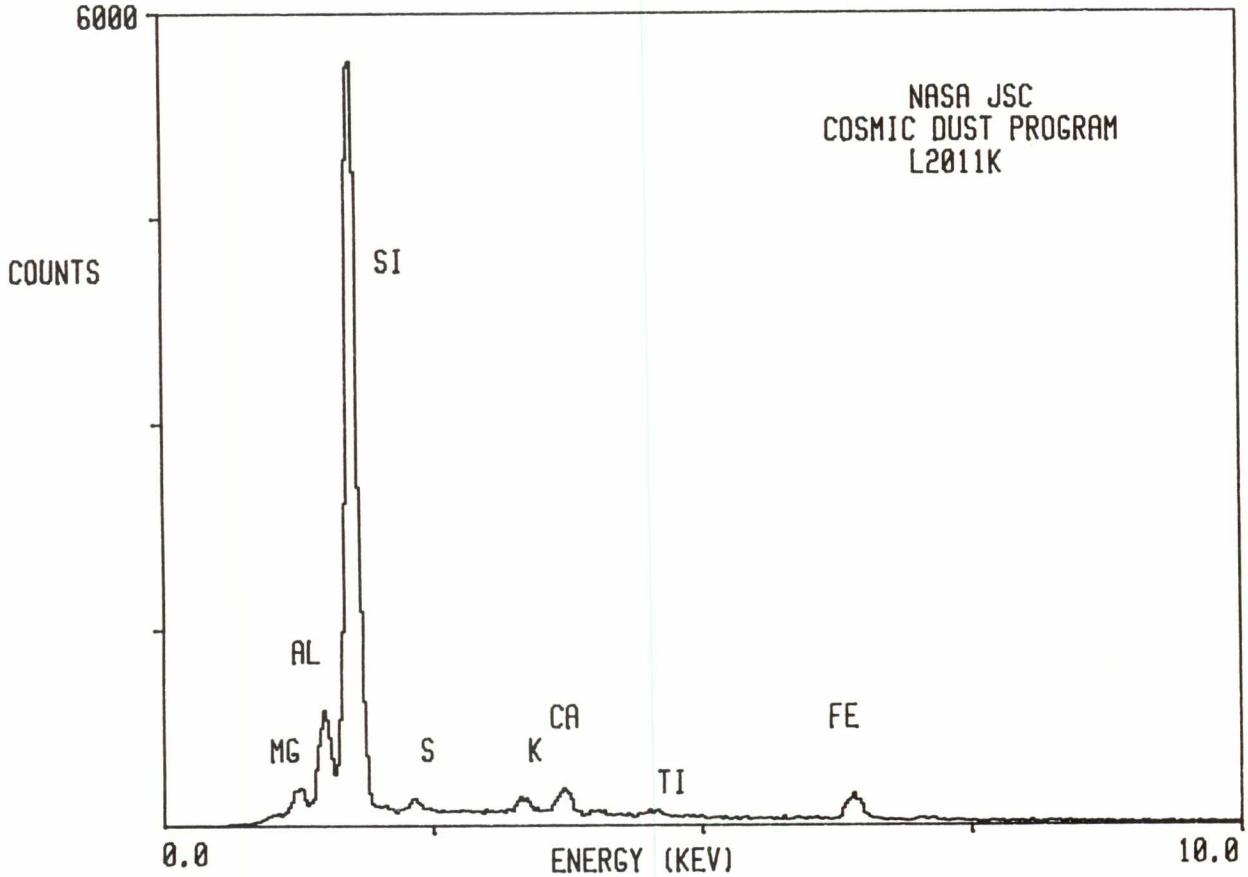
L2011 K 3



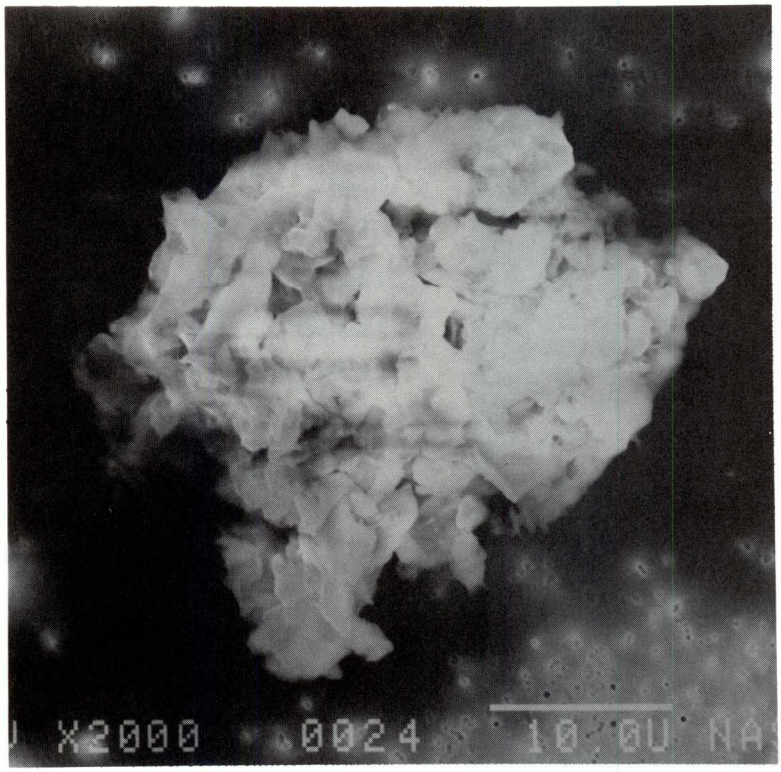
S-92-35785

SIZE: 28x22
SHAPE: E
TRANS.: TL/O
COLOR: White to Brown
LUSTER: R
TYPE: TCN

COMMENTS:



L2011 K 6



S-92-35788

SIZE: 34x29

SHAPE: E

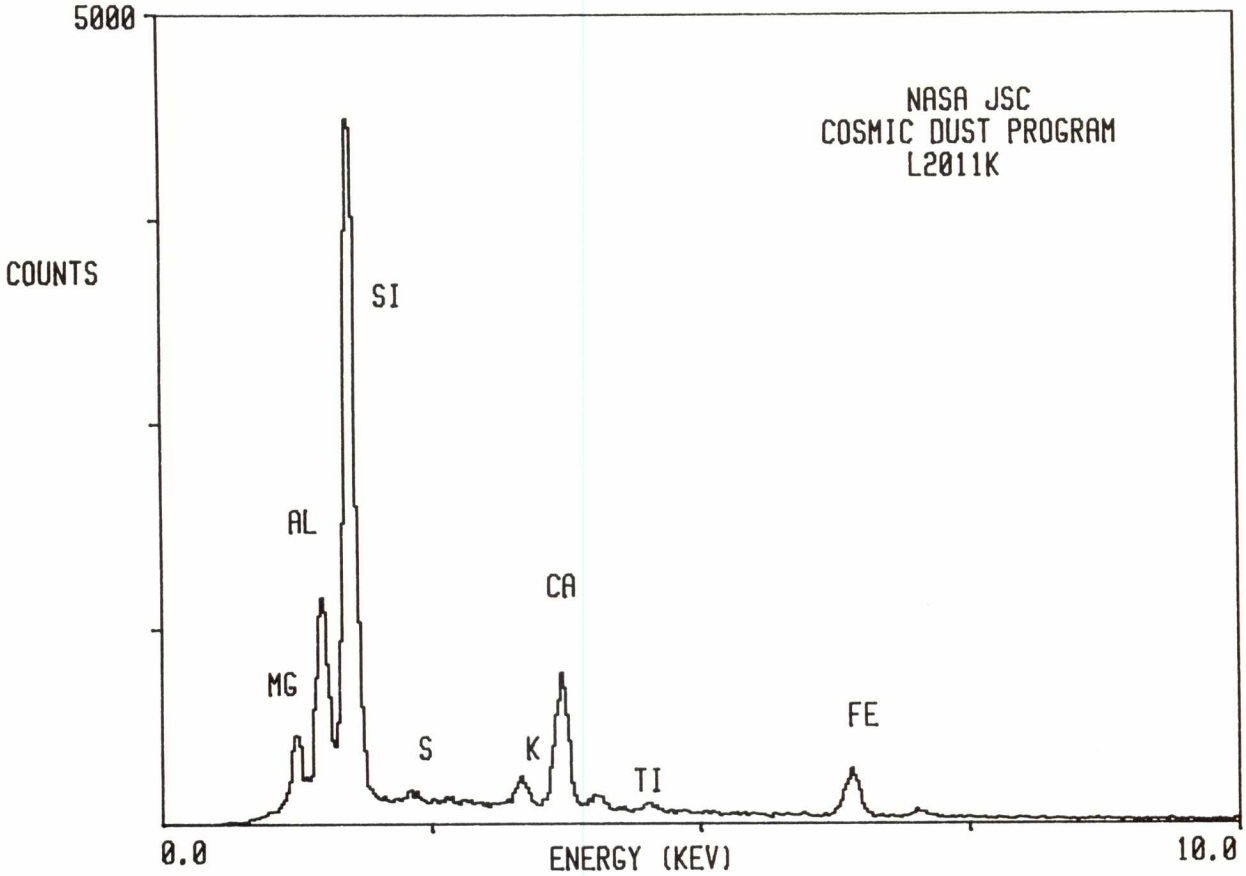
TRANS.: TL

COLOR: Black to Brown

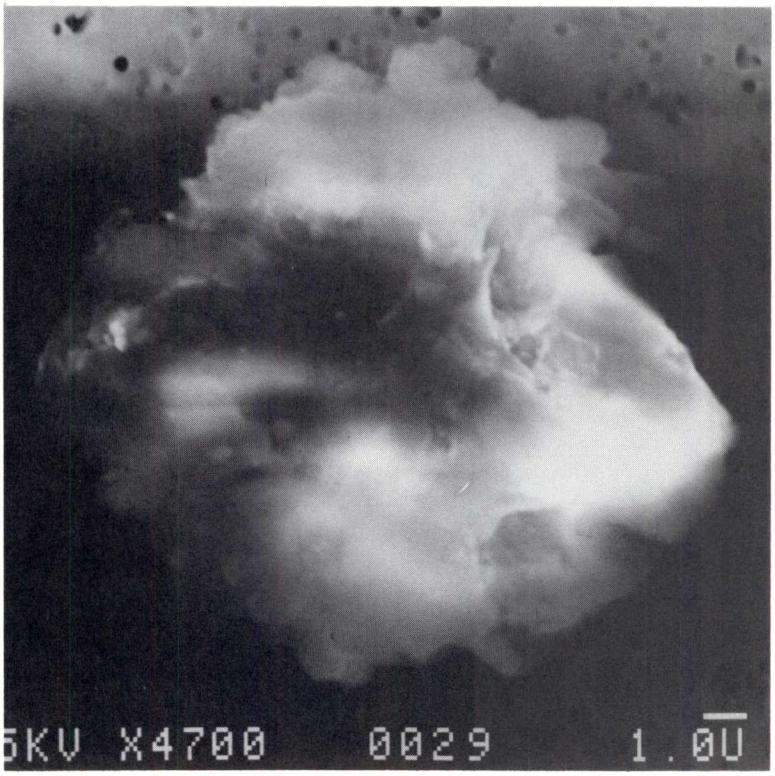
LUSTER: V

TYPE: TCN

COMMENTS:



L2011 K 8



S-92-35790

SIZE: 18

SHAPE: E

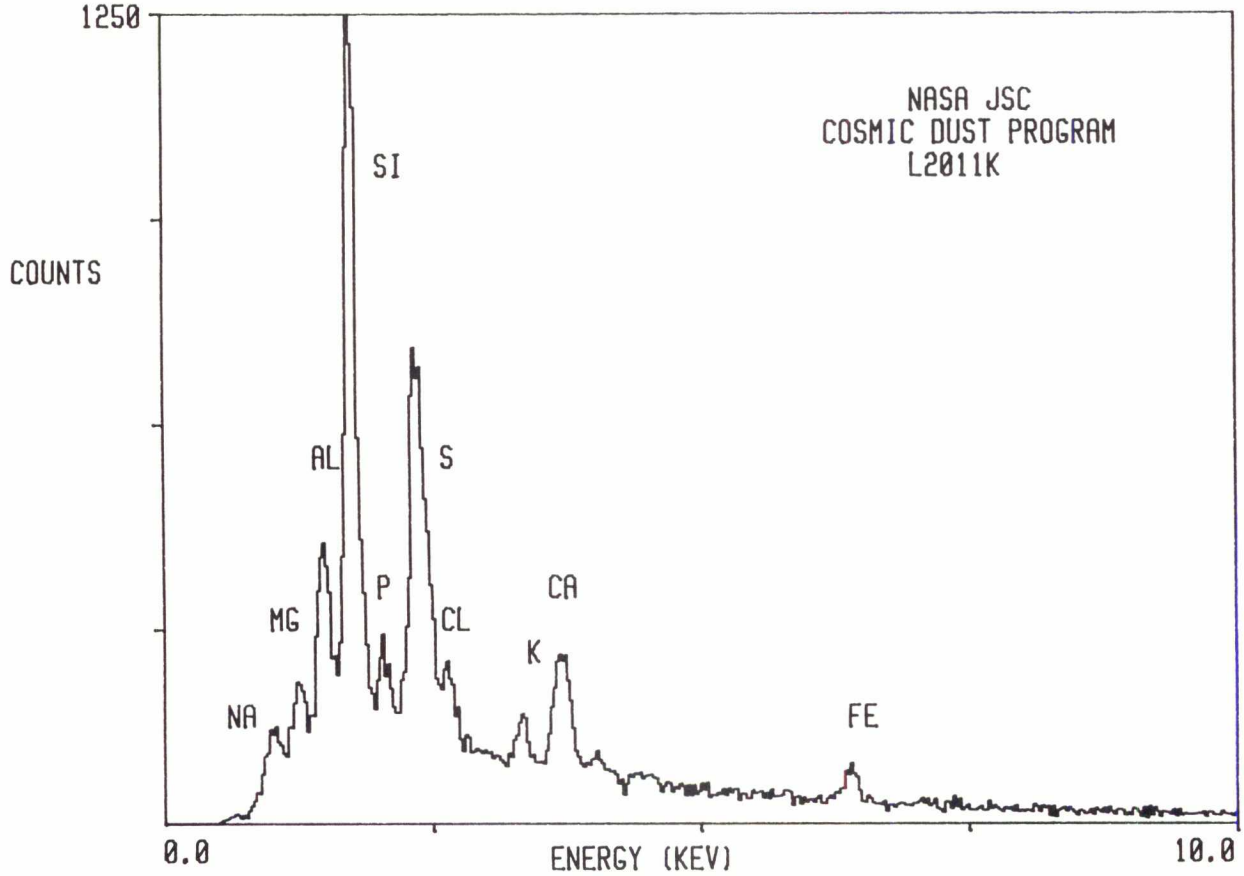
TRANS.: TL

COLOR: Brown to Black

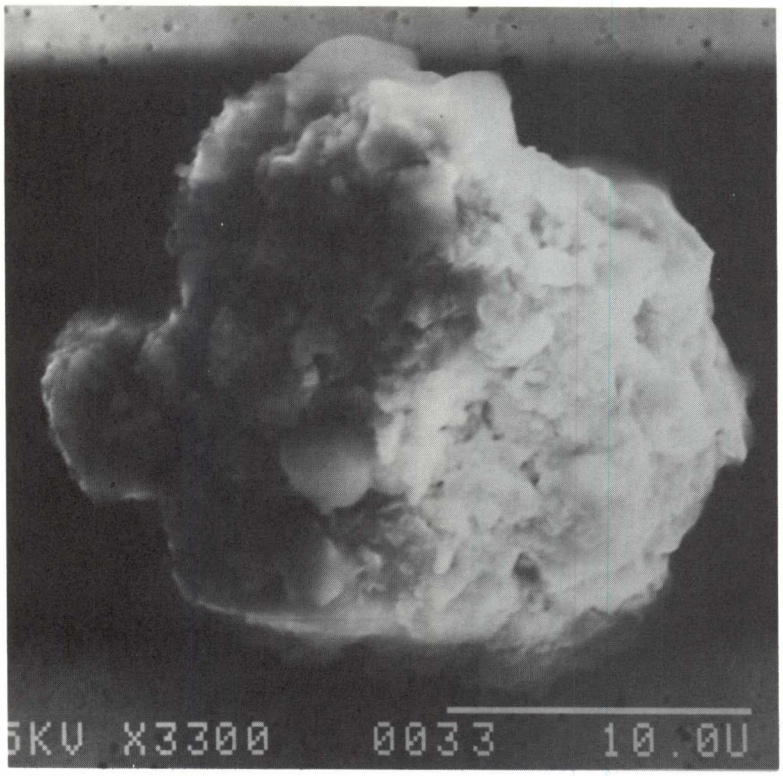
LUSTER: V

TYPE: TCN

COMMENTS:



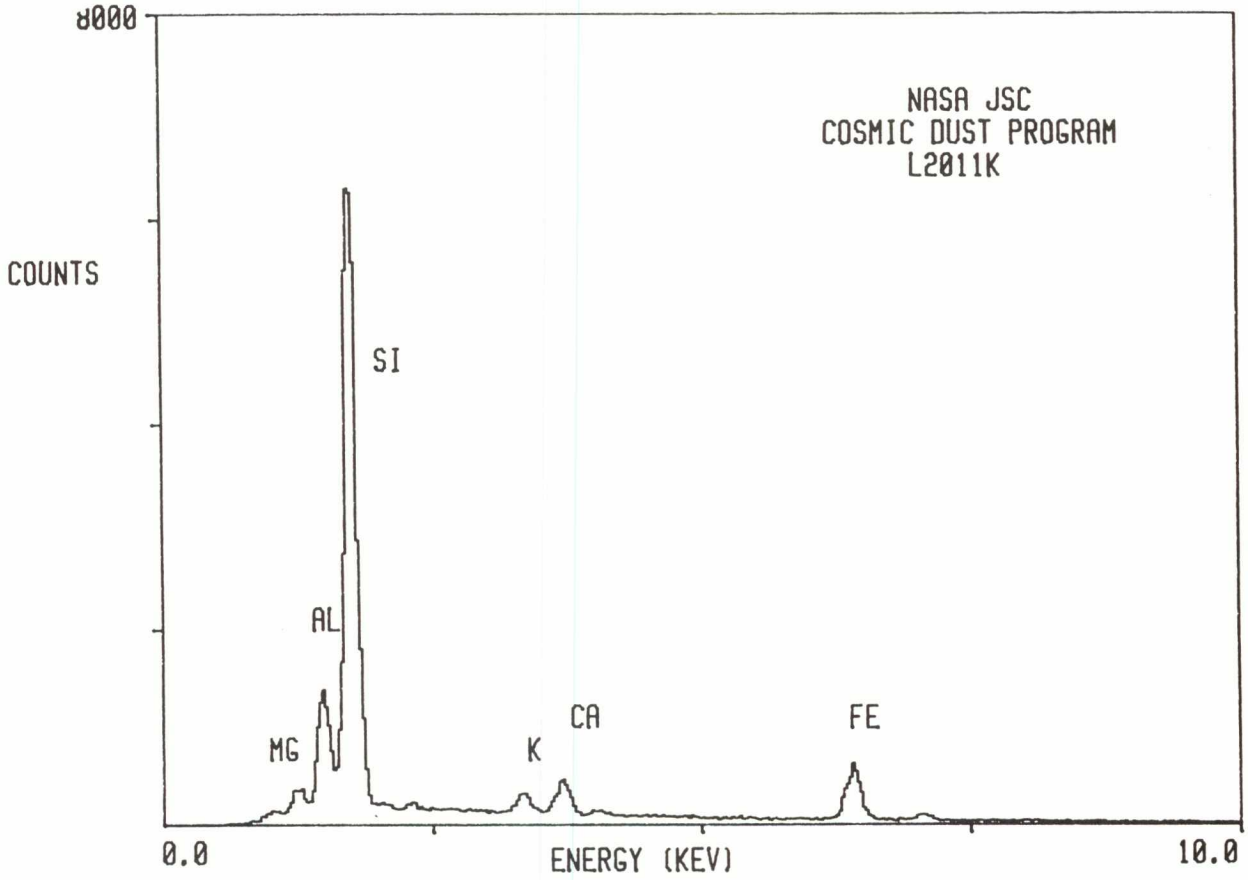
L2011 K 9



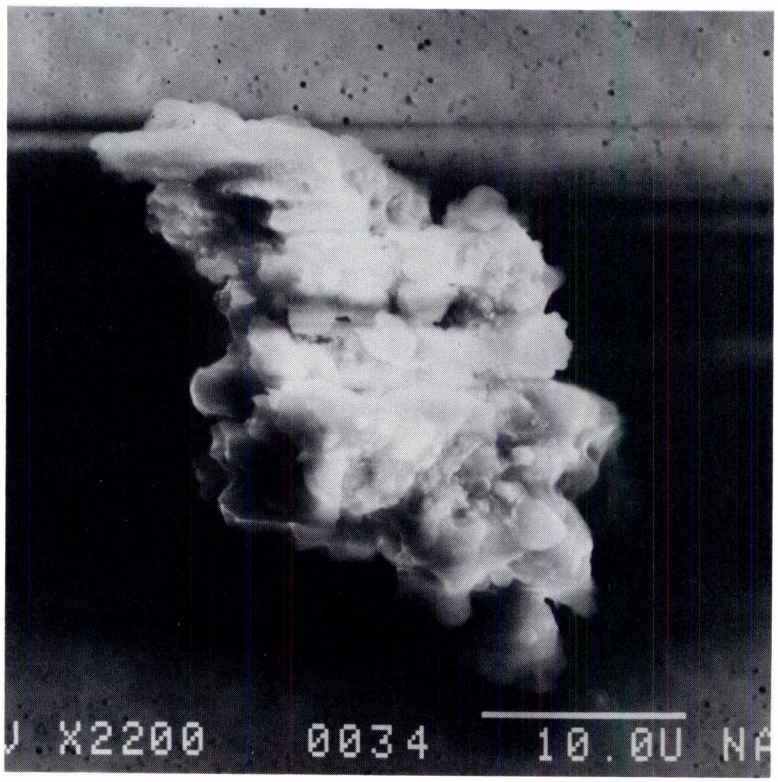
S-92-35791

SIZE: 25x22
SHAPE: E
TRANS.: TL
COLOR: Black
LUSTER: V
TYPE: TCN

COMMENTS:



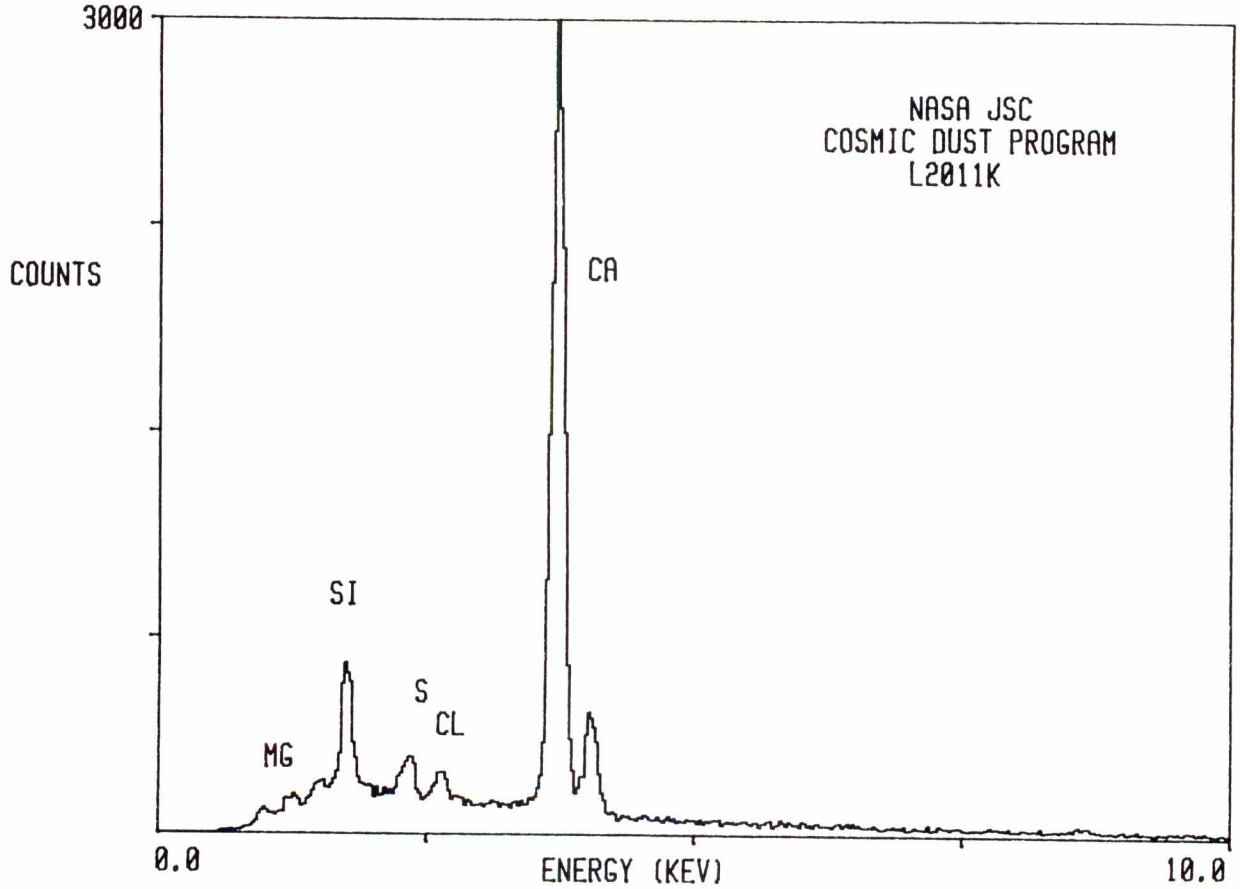
L2011 K 10



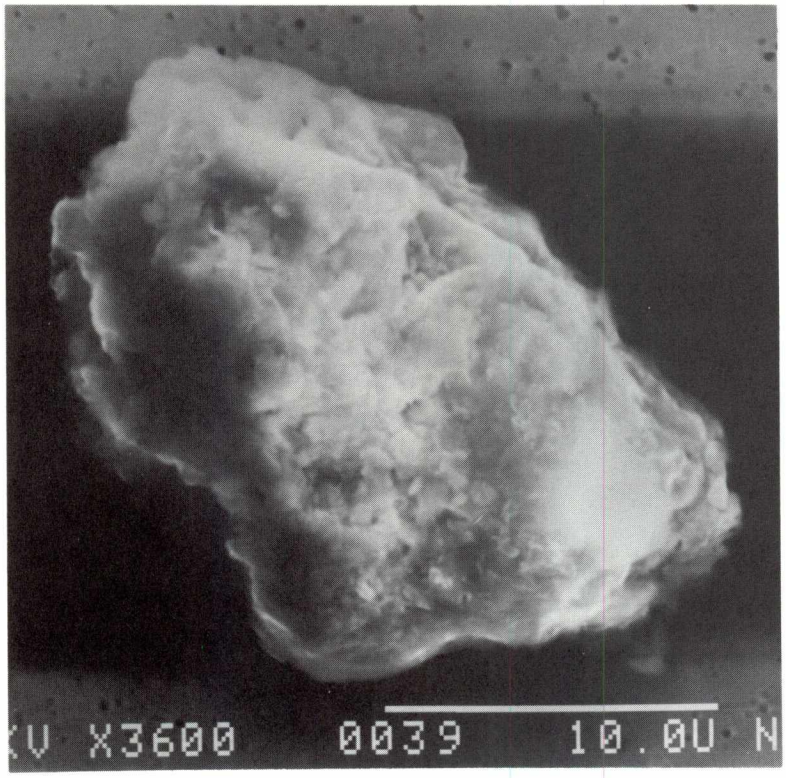
S-92-35792

SIZE: 34x24
SHAPE: I
TRANS.: TL
COLOR: Black
LUSTER: D
TYPE: TCN?

COMMENTS:



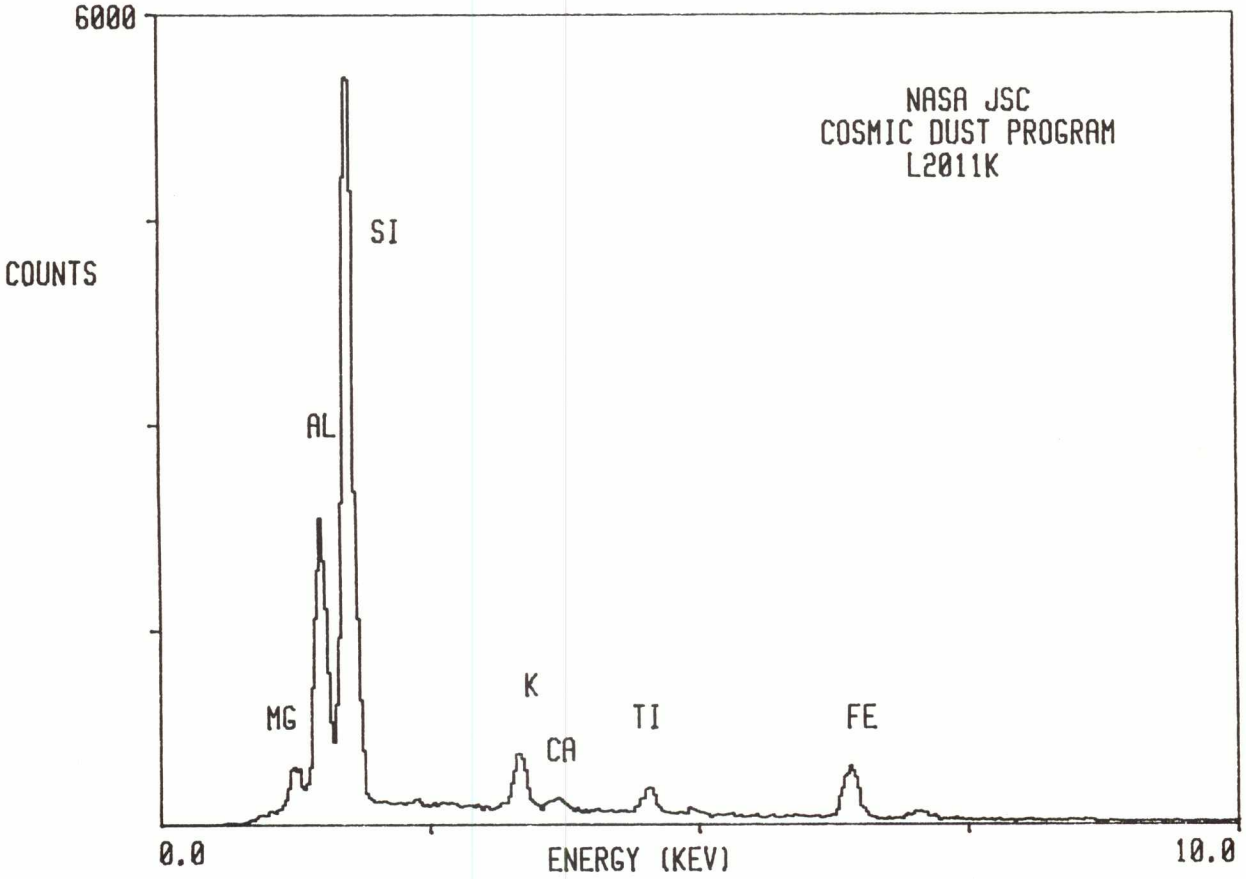
L2011 K 13



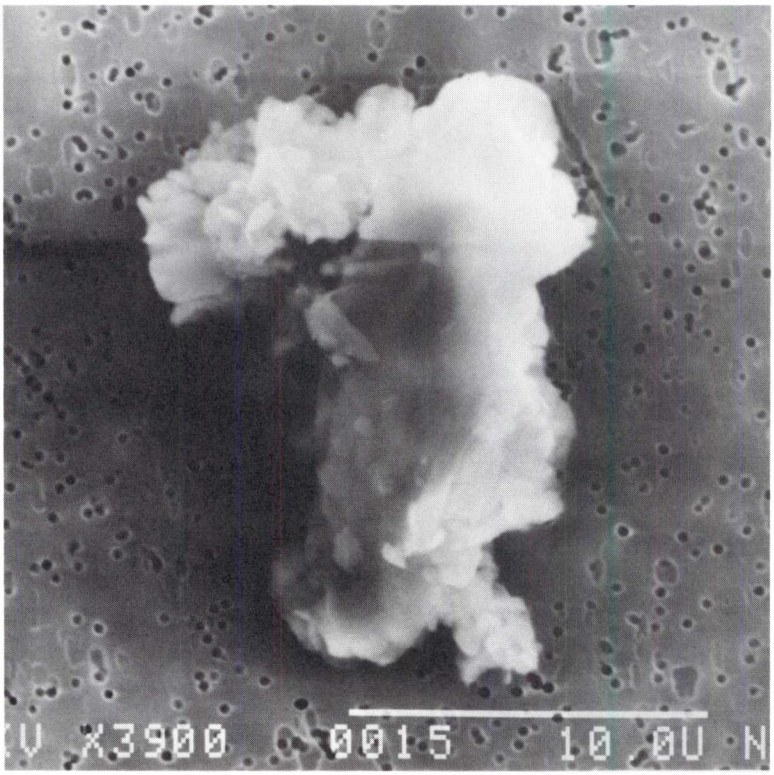
S-92-35795

SIZE: 24x18
SHAPE: I/E
TRANS.: TL
COLOR: Colorless
LUSTER: R
TYPE: TCN

COMMENTS:

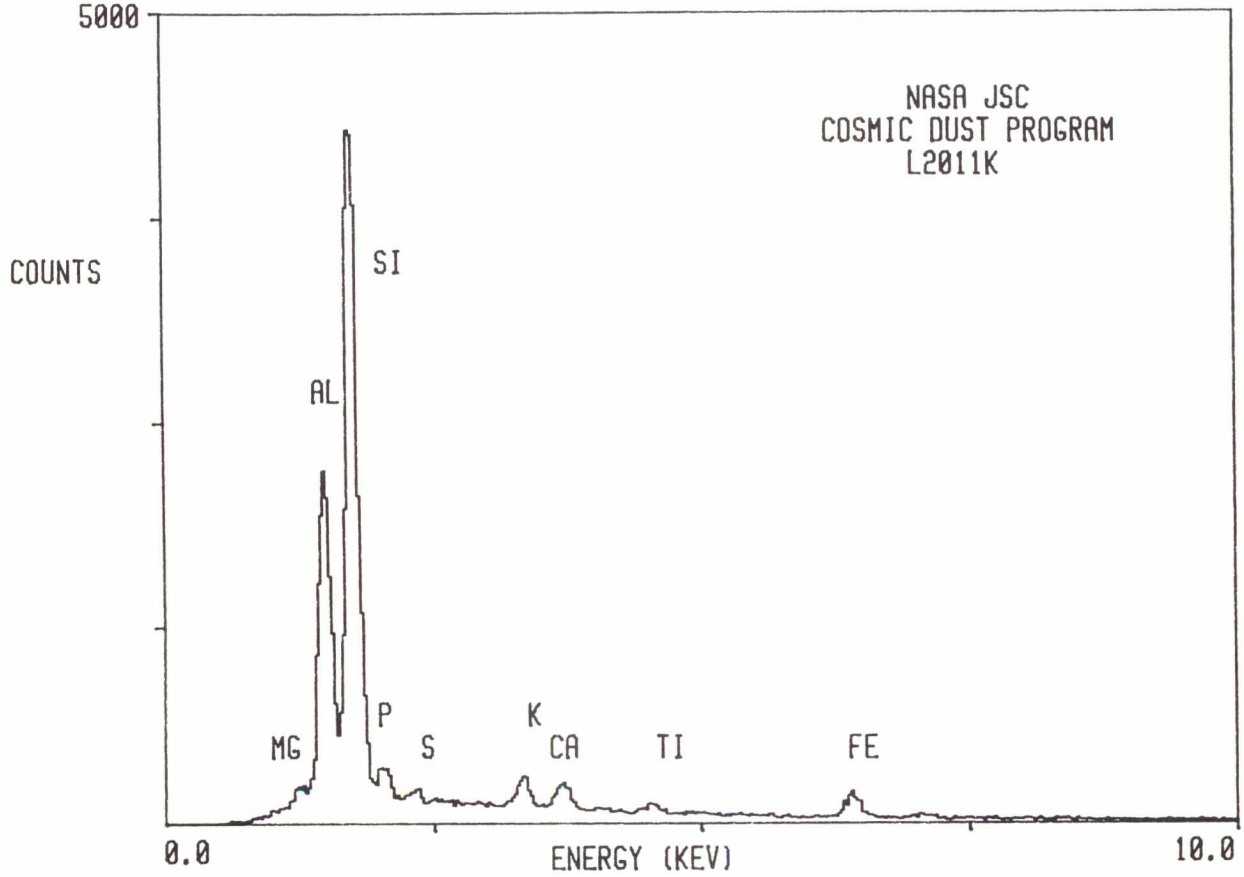


L2011 K 15

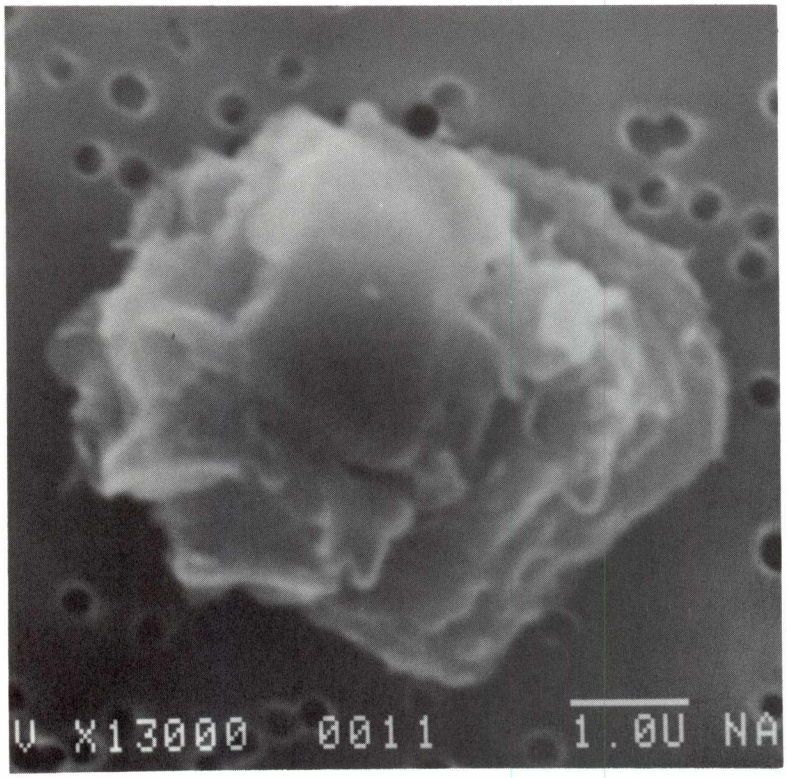


S-92-35797

SIZE: 18x13
SHAPE: I
TRANS.: TL
COLOR: Black
LUSTER: D
TYPE: TCN
COMMENTS:



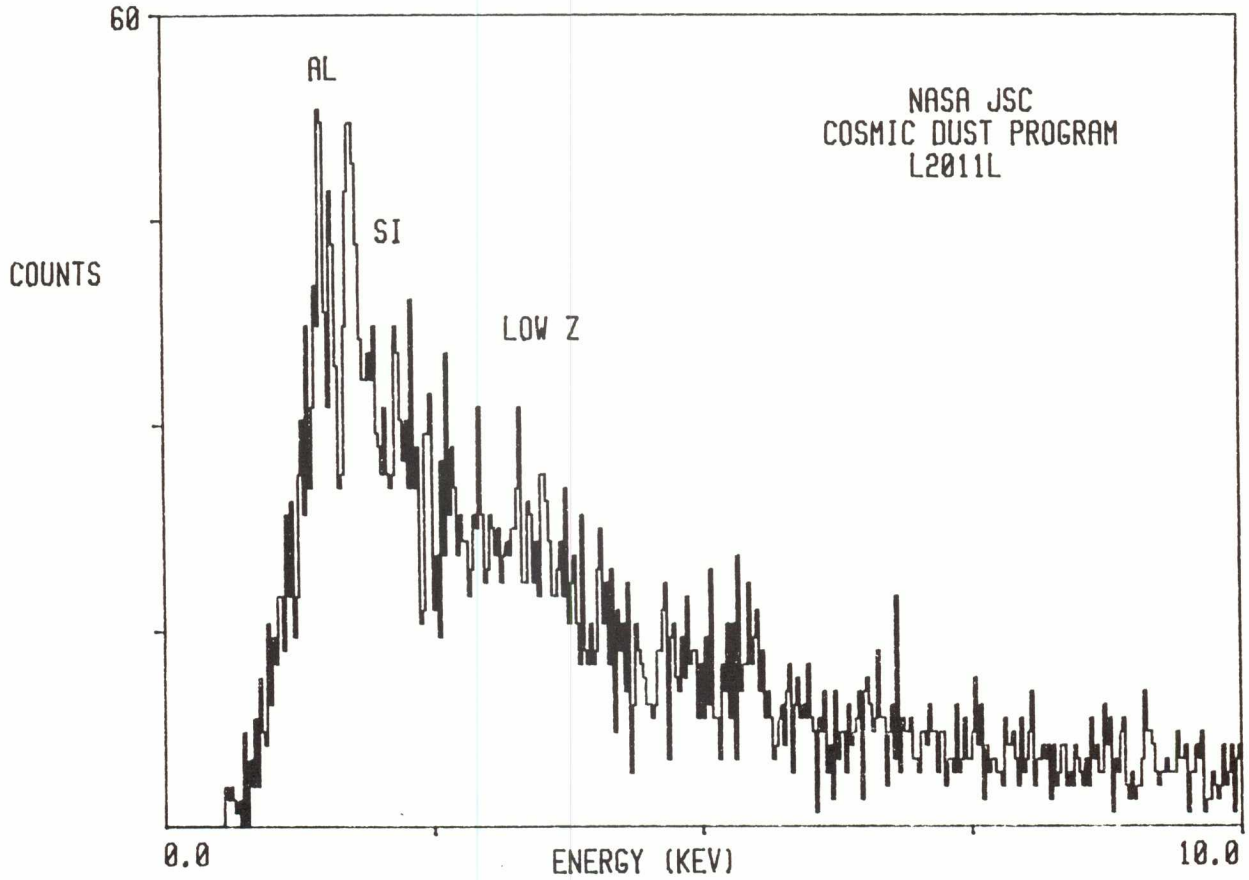
L2011 L 6



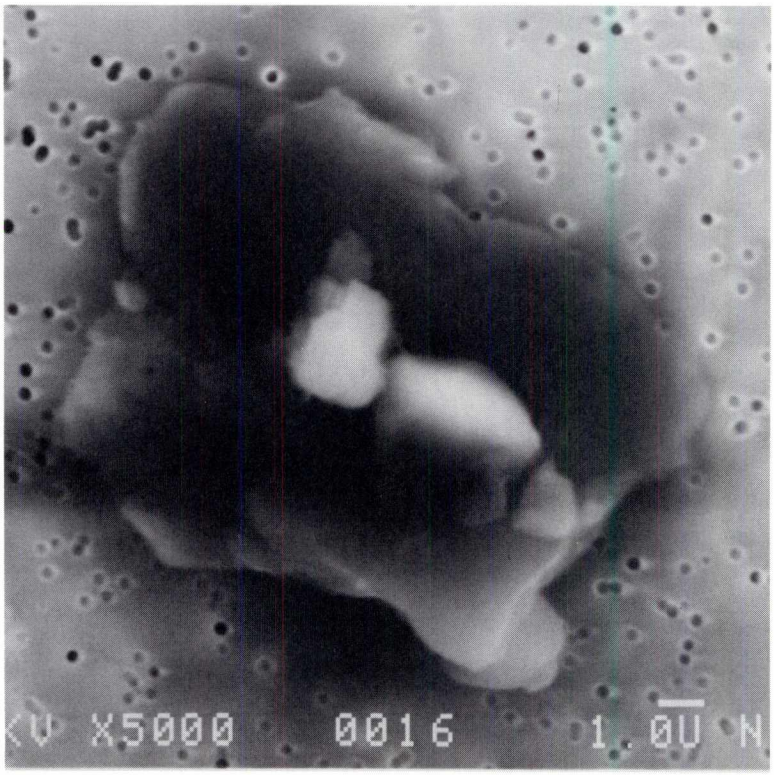
S-92-35777

SIZE: 6x5
SHAPE: I
TRANS.: TL
COLOR: Black
LUSTER: R
TYPE: TCN?

COMMENTS:



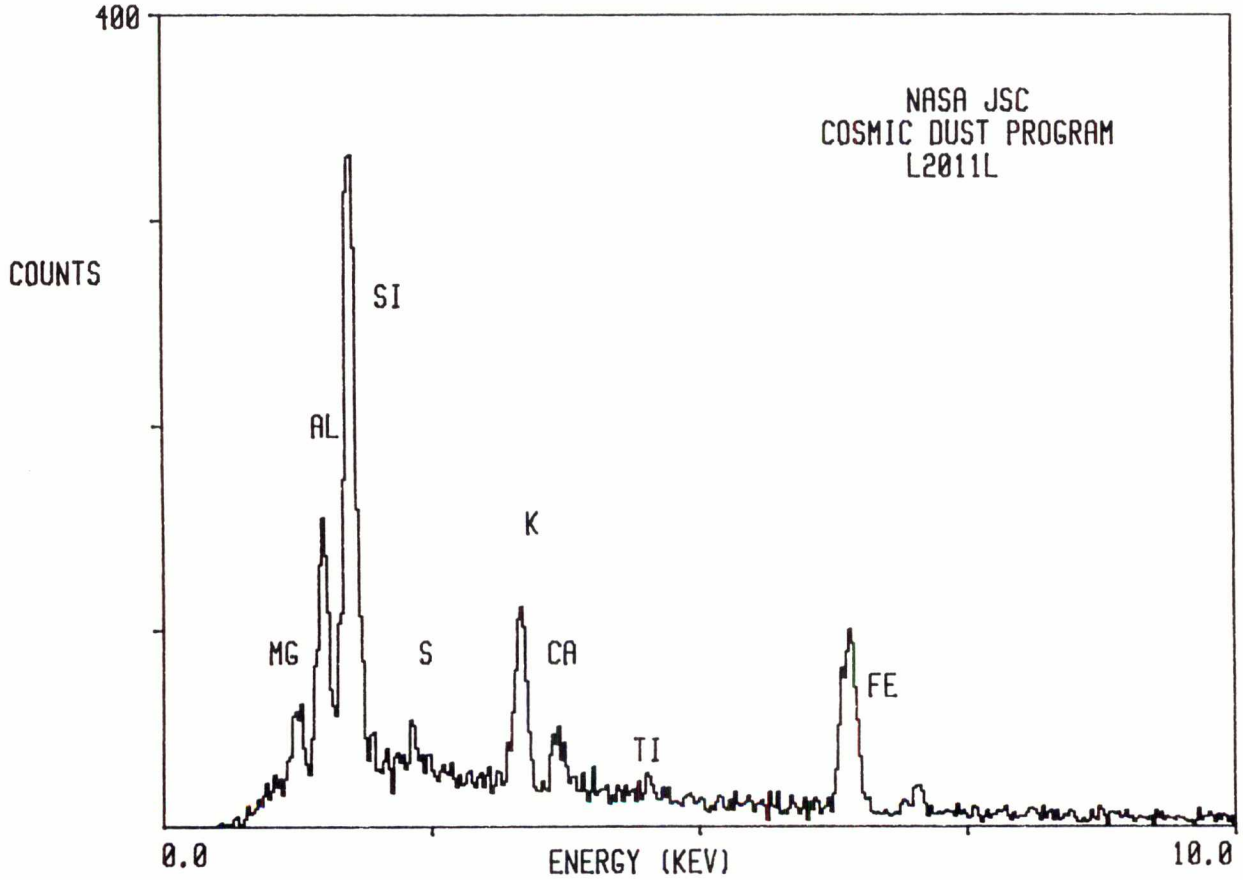
L2011 L 8



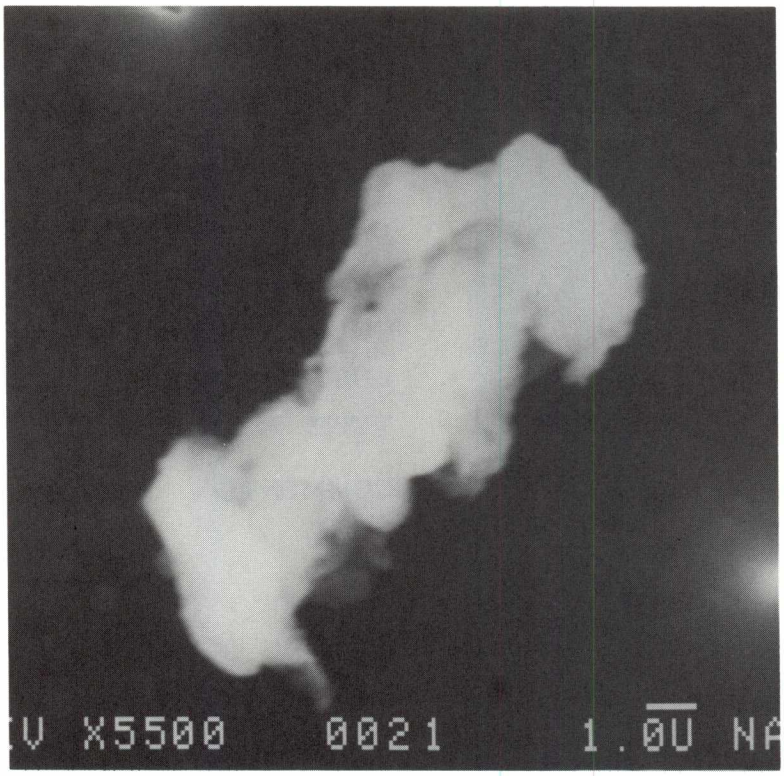
S-92-35779

SIZE: 27x25
SHAPE: E
TRANS.: TL/O
COLOR: Black
LUSTER: V
TYPE: TCN

COMMENTS:



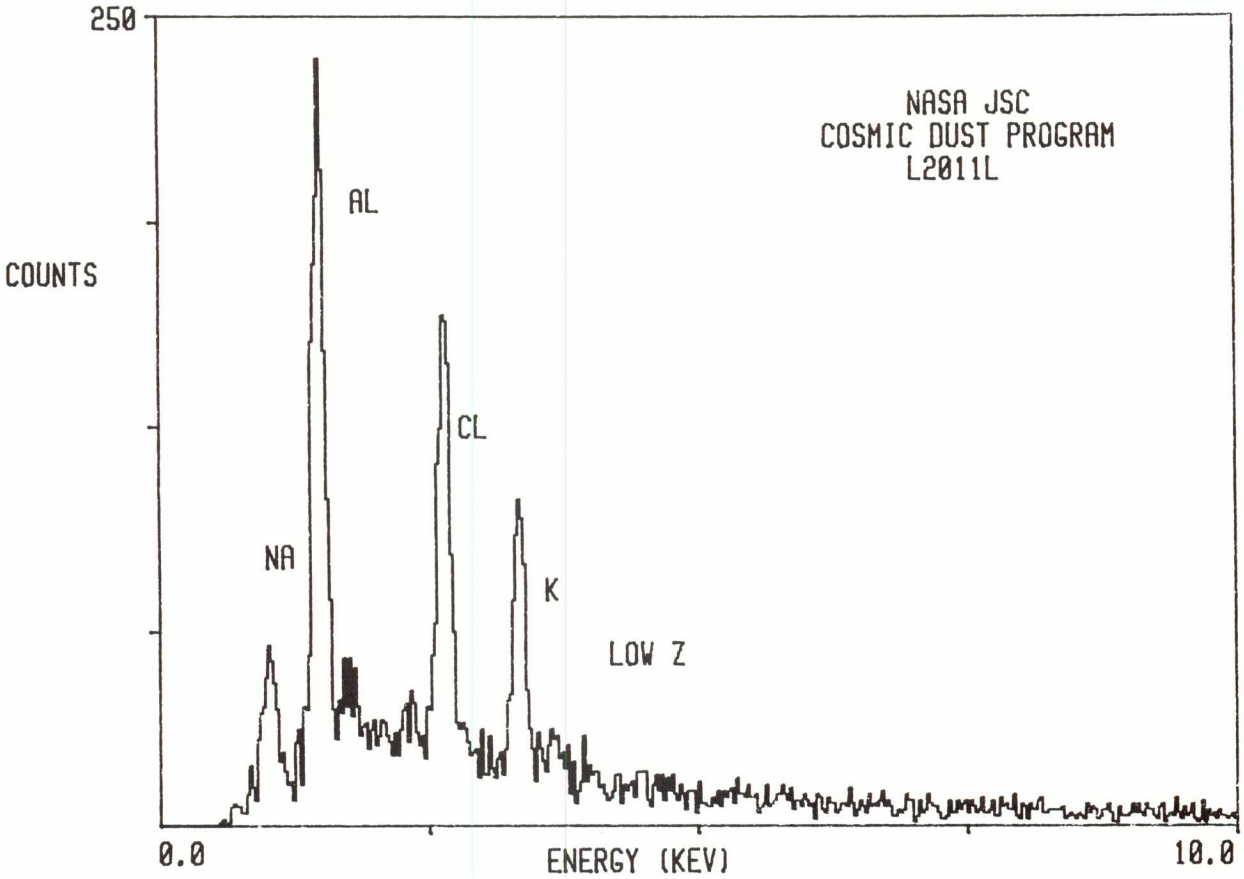
L2011 L 11



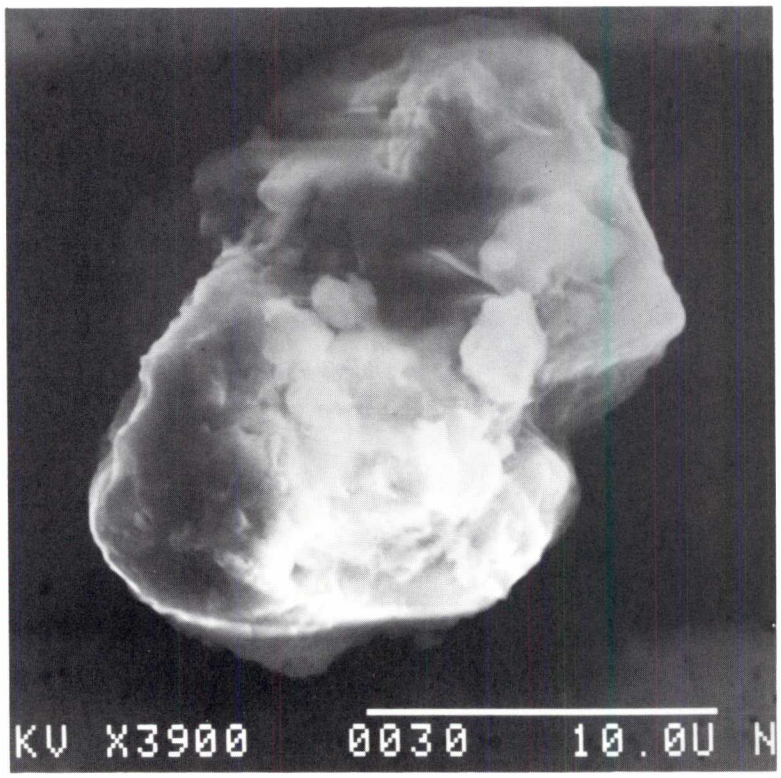
S-92-35782

SIZE: 12x6
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCN

COMMENTS:



L2011 M 4



S-92-35401

SIZE: 20x13

SHAPE: E

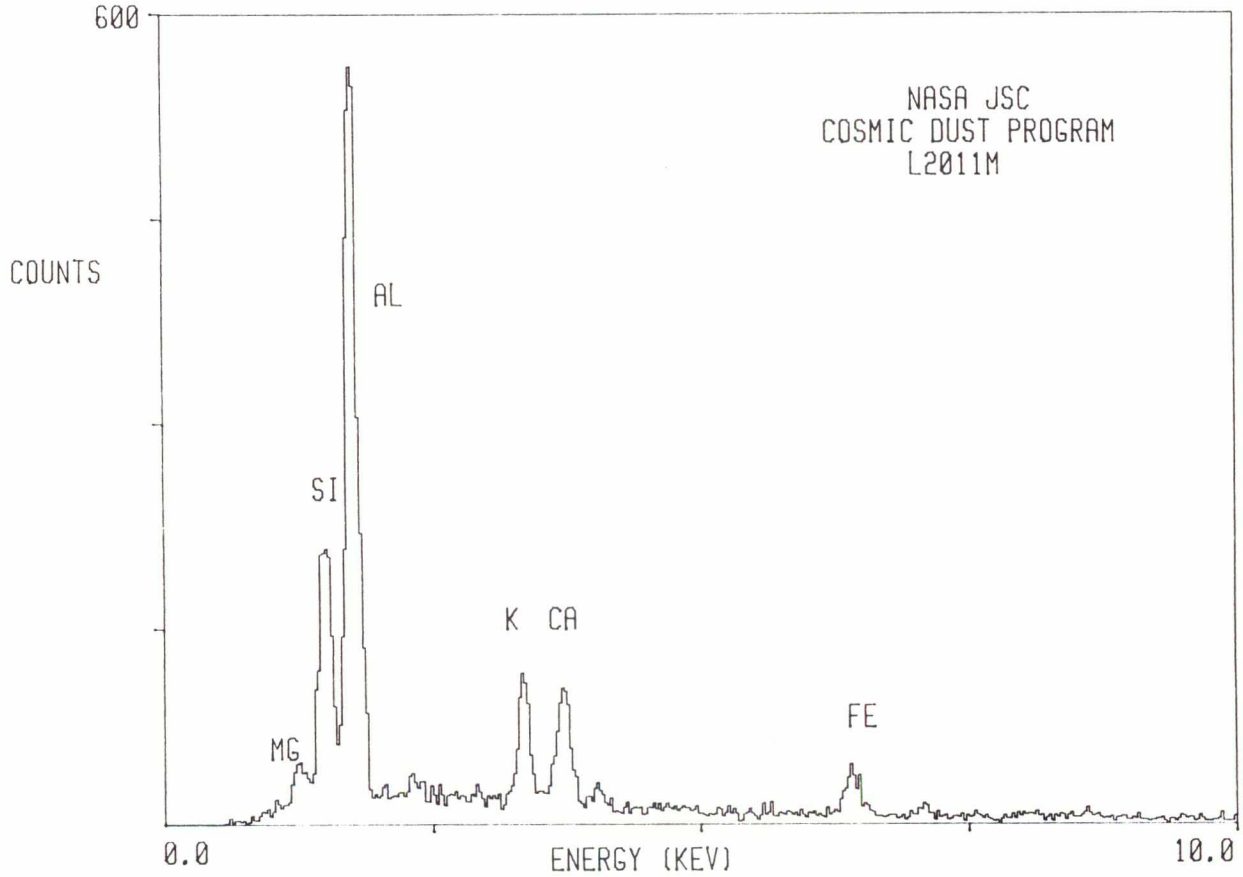
TRANS.: O

COLOR: Brown to Black

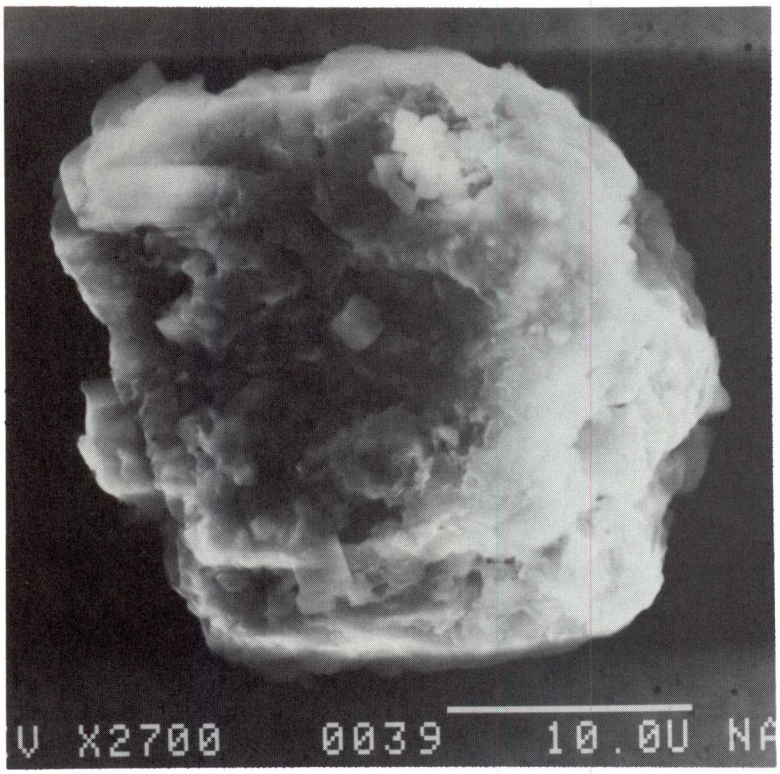
LUSTER: SM

TYPE: TCN

COMMENTS:



L2011 M 9



S-92-35406

SIZE: 29x28

SHAPE: E

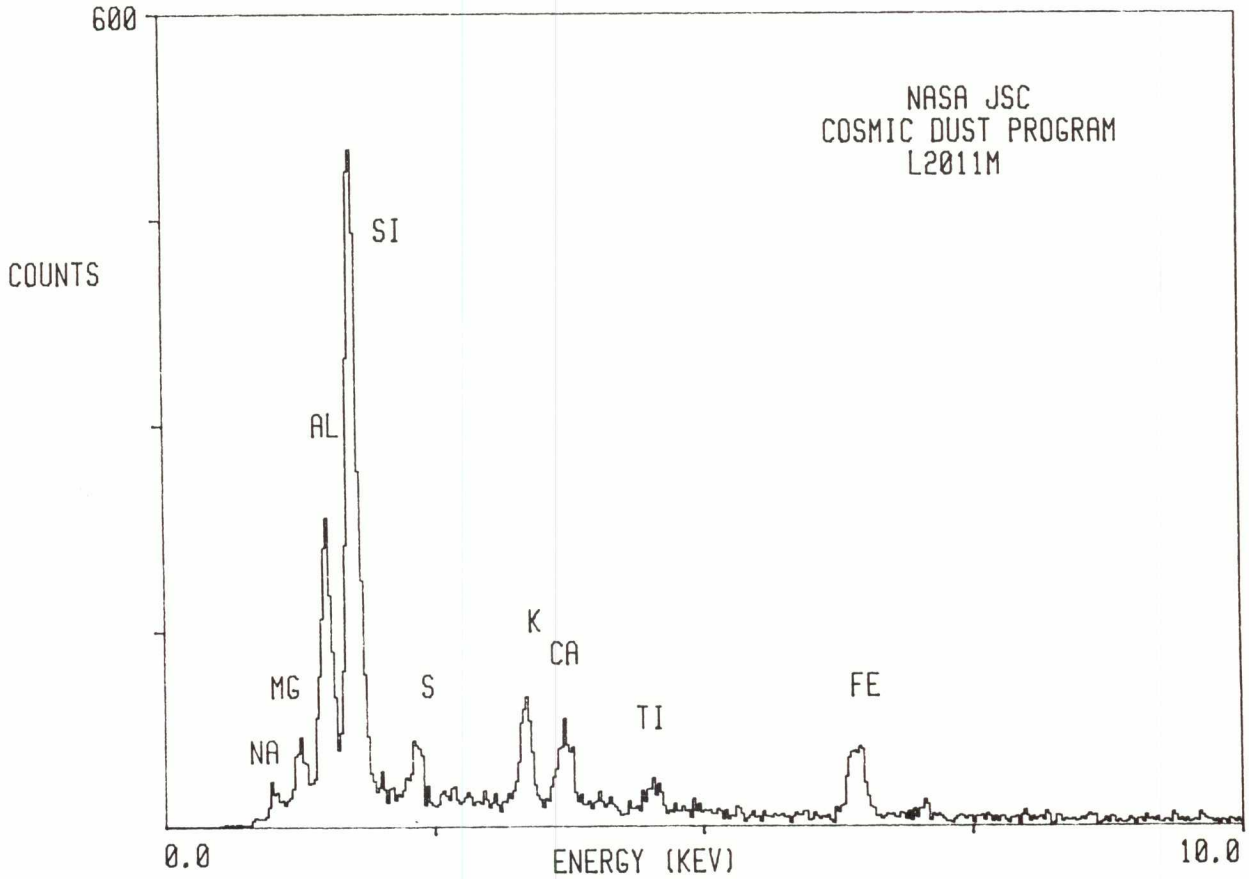
TRANS.: O

COLOR: Brown to Black

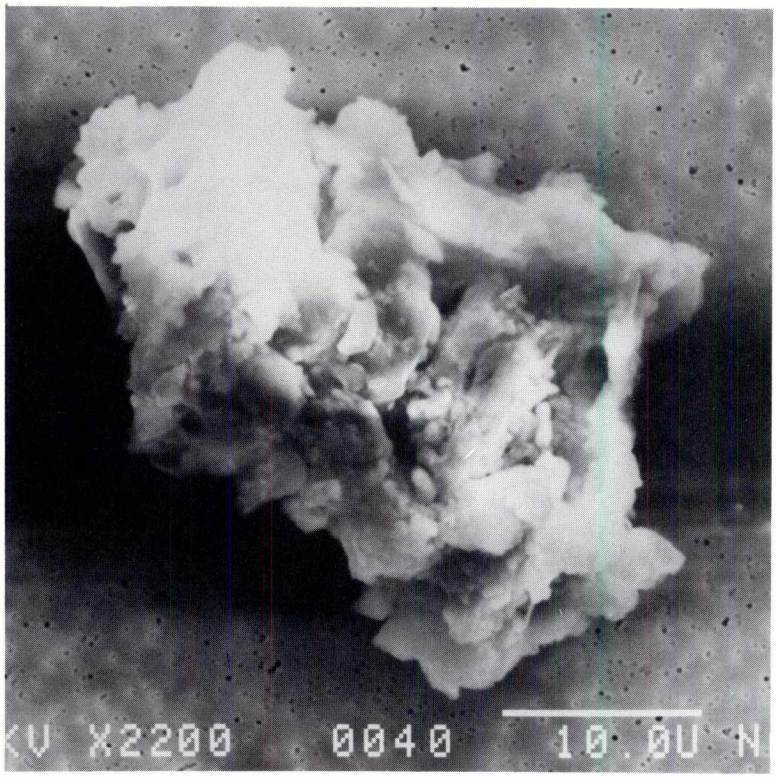
LUSTER: M

TYPE: TCN

COMMENTS:



L2011 M 10



S-92-35407

SIZE: 40x28

SHAPE: E

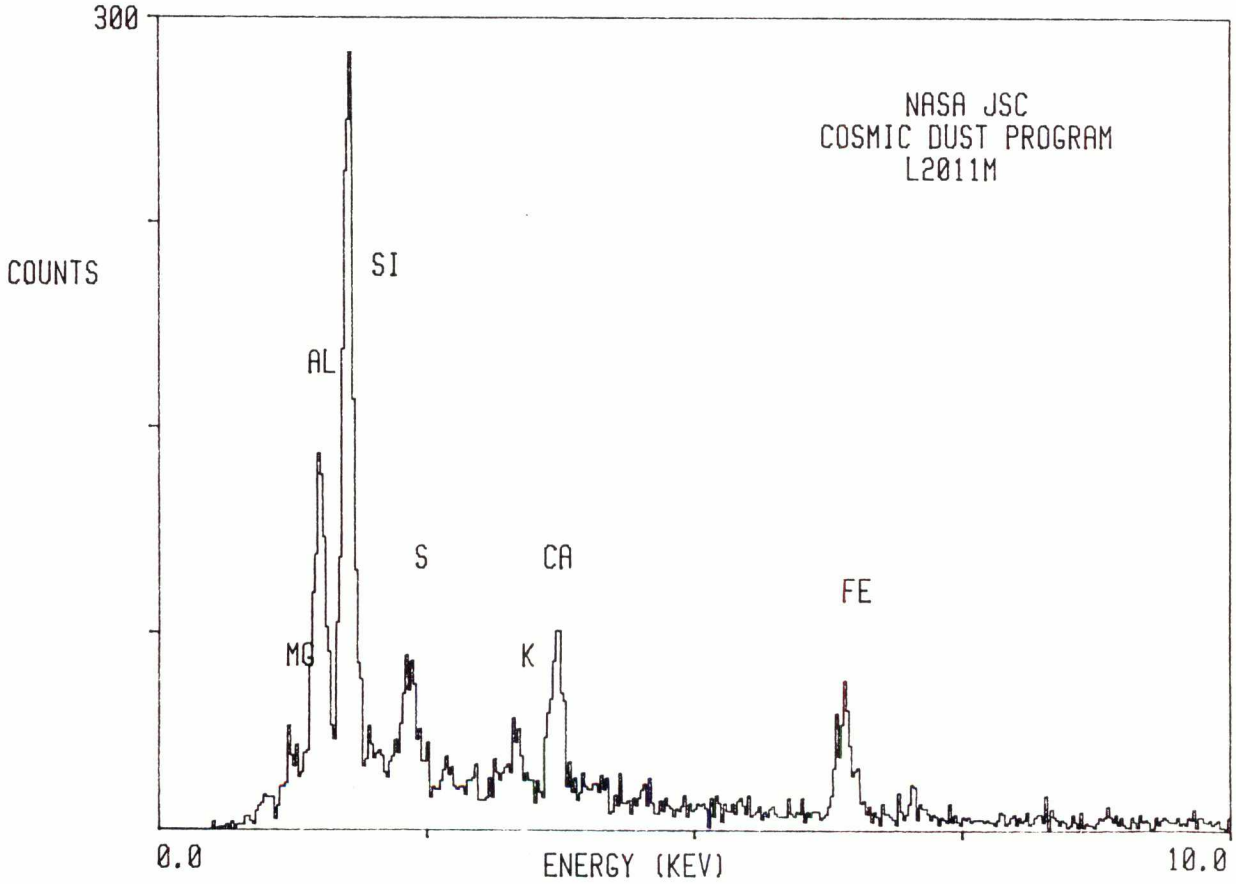
TRANS.: O

COLOR: Red to Brown to Black

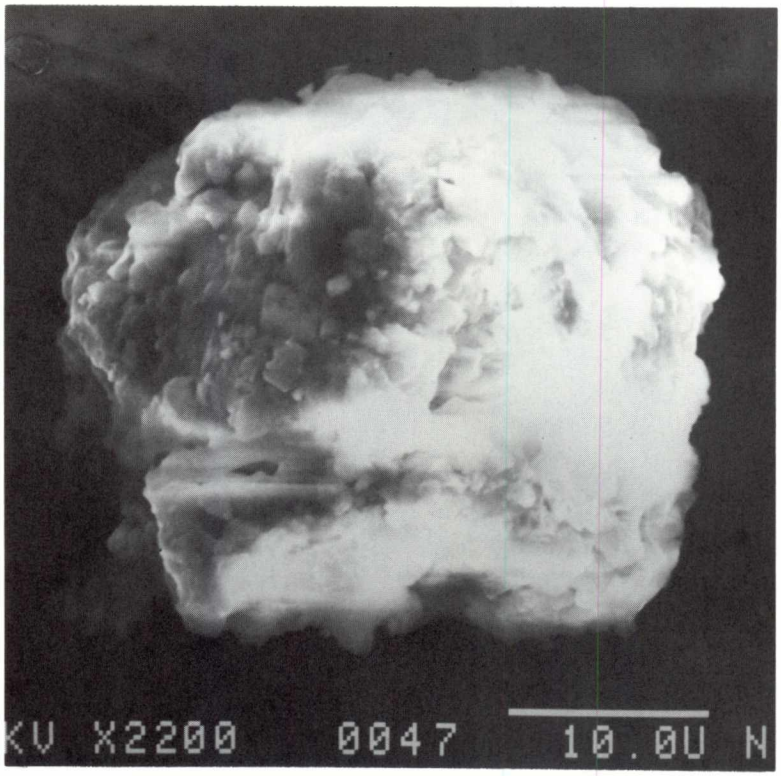
LUSTER: R

TYPE: TCN

COMMENTS:



L2011 M 14



S-92-35411

SIZE: 35x29

SHAPE: I

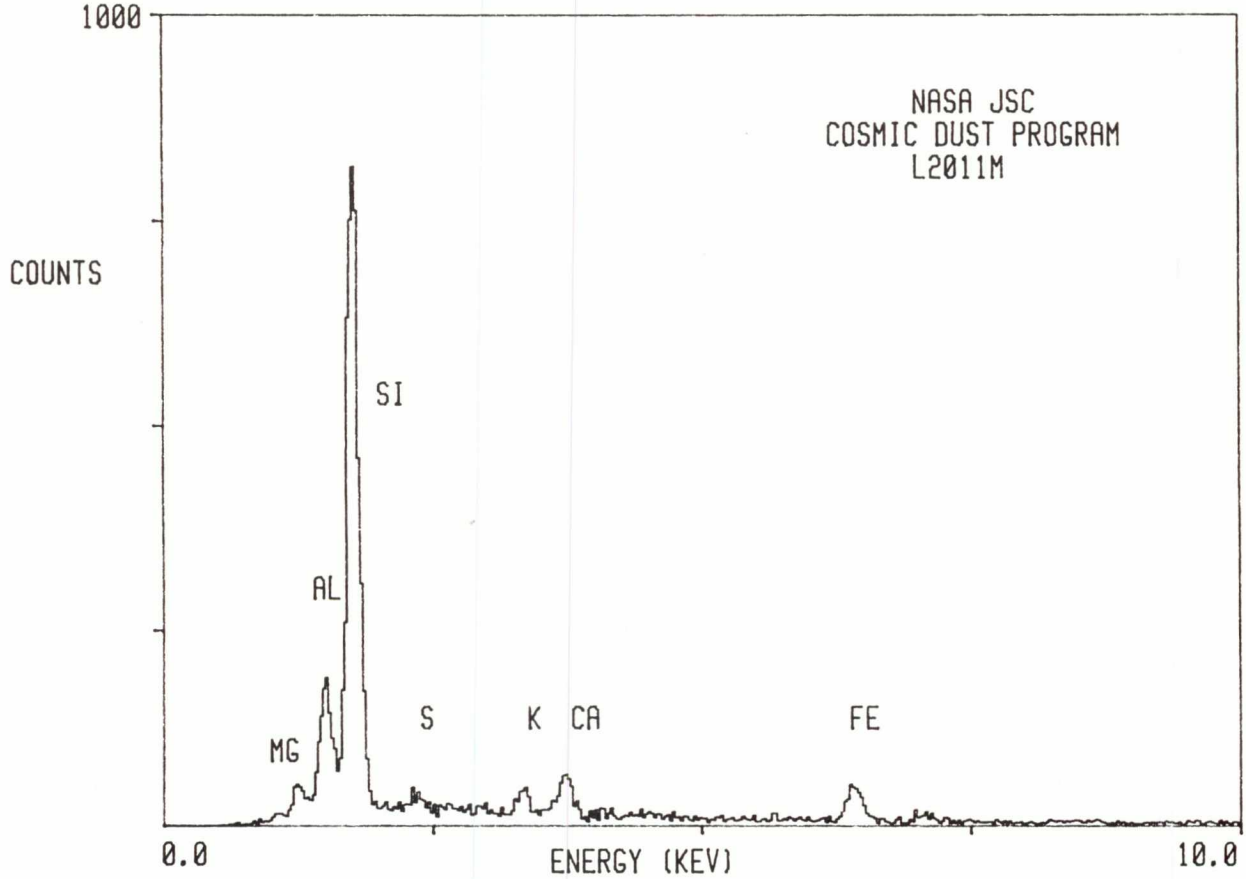
TRANS.: O

COLOR: Brown to Black

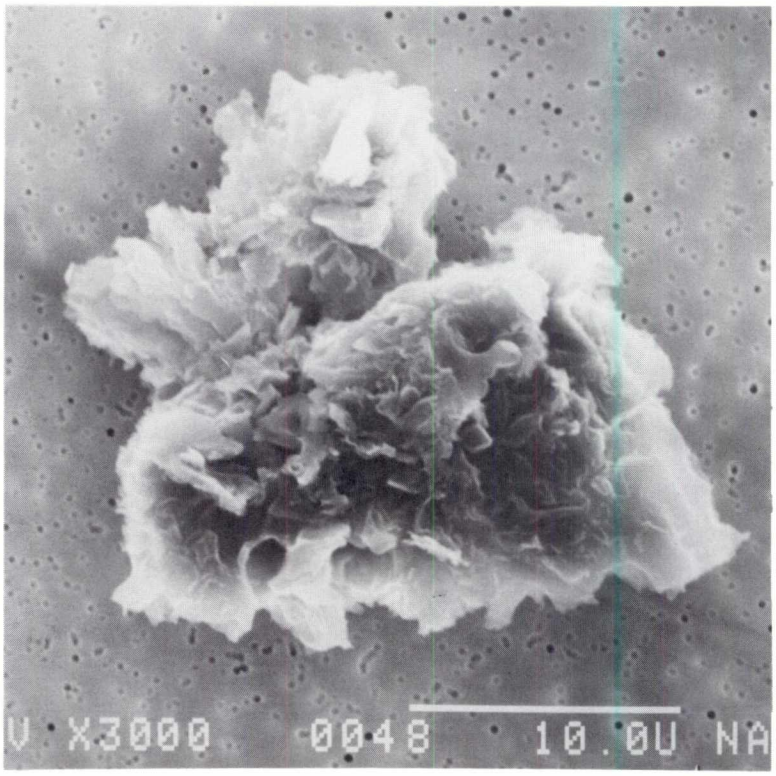
LUSTER: M

TYPE: TCN

COMMENTS:



L2011 M 15



S-92-35412

SIZE: 26x20

SHAPE: I

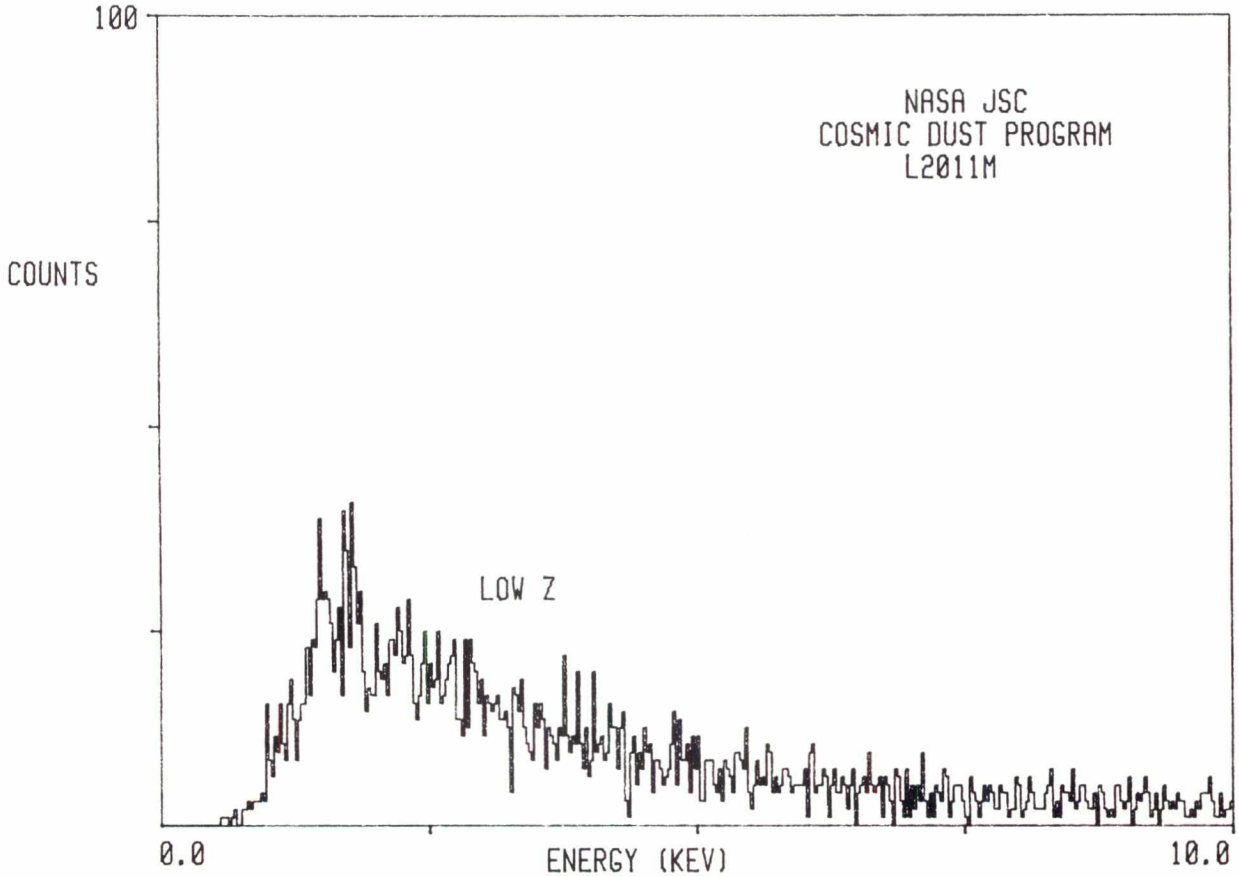
TRANS.: O

COLOR: Black

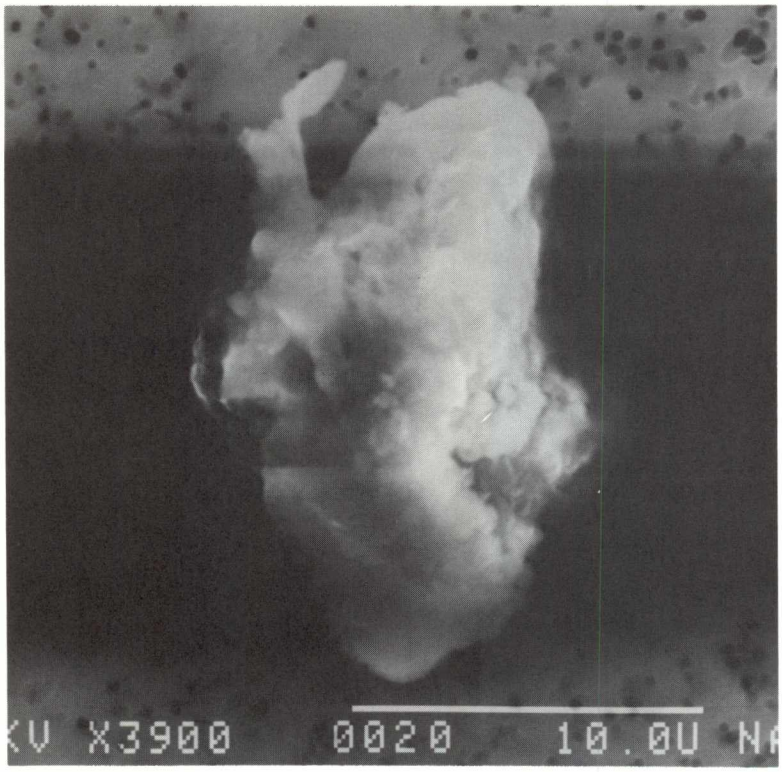
LUSTER: D

TYPE: TCN?

COMMENTS:



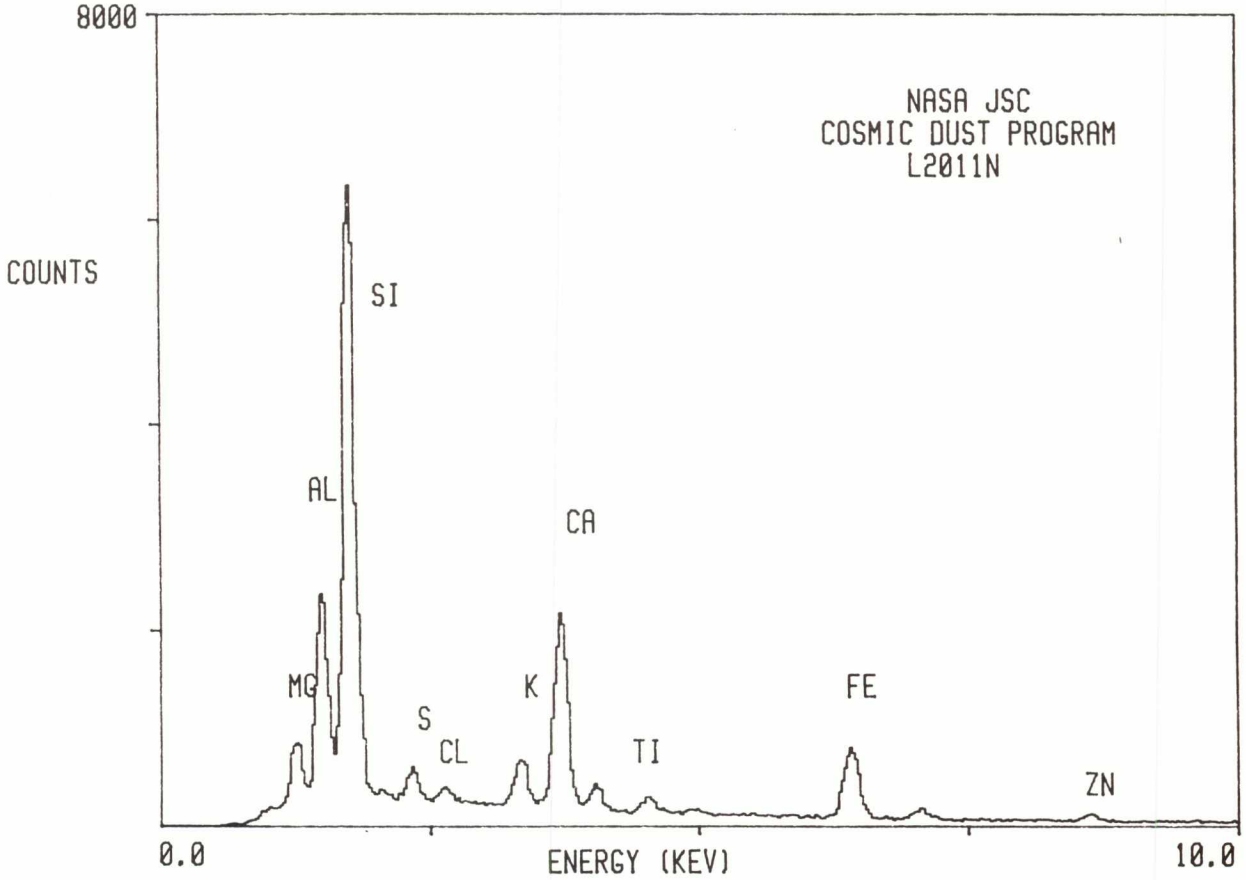
L2011 N 9



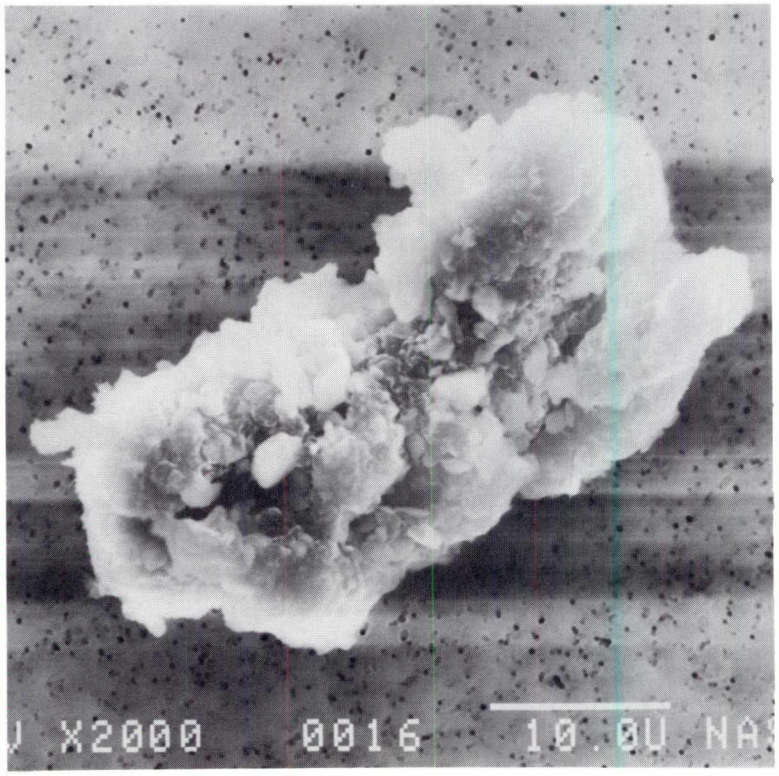
SIZE: 17x13
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCN

COMMENTS:

S-92-35356



L2011 N 14



S-92-35361

SIZE: 46x22

SHAPE: E

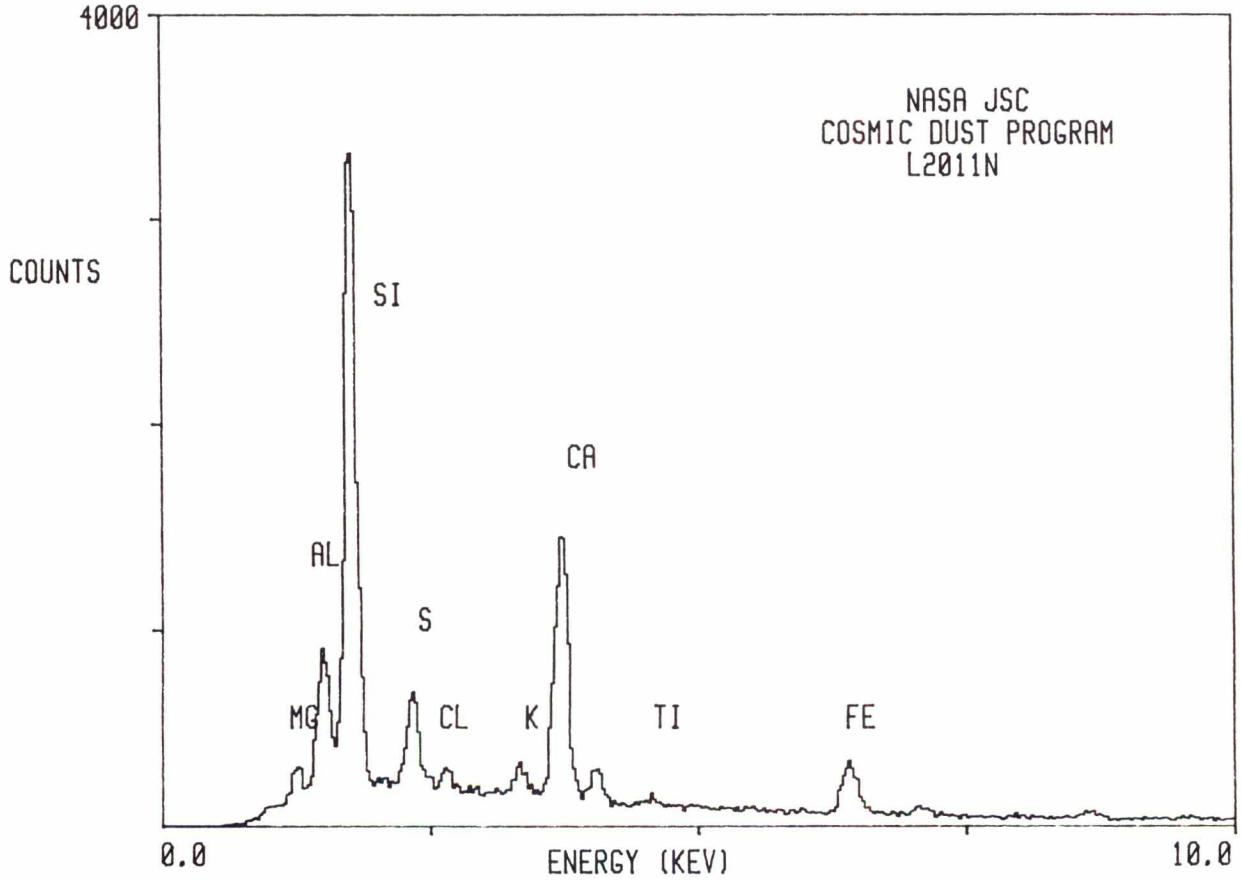
TRANS.: O

COLOR: Brown to Black

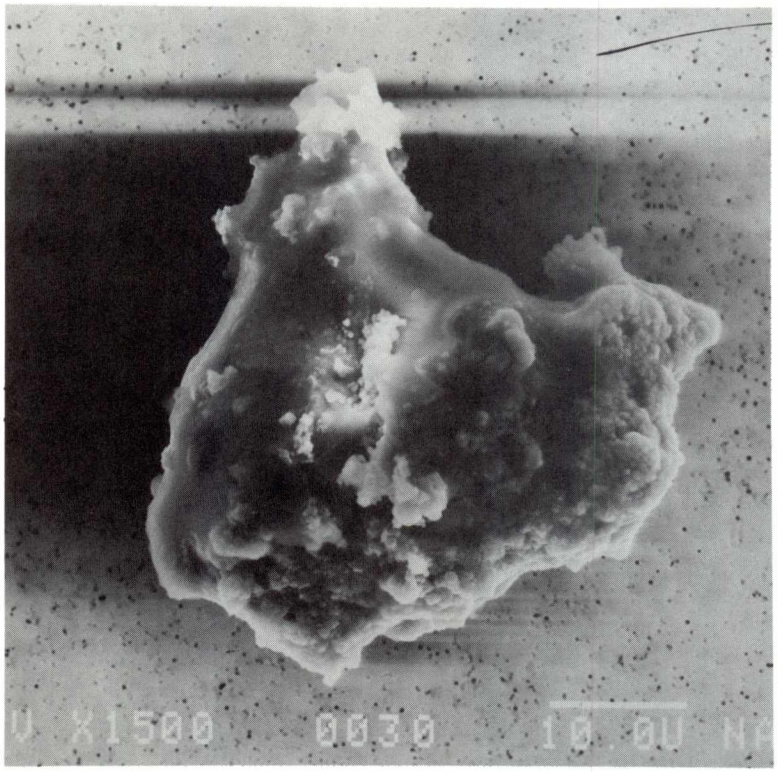
LUSTER: SM

TYPE: TCN?

COMMENTS:



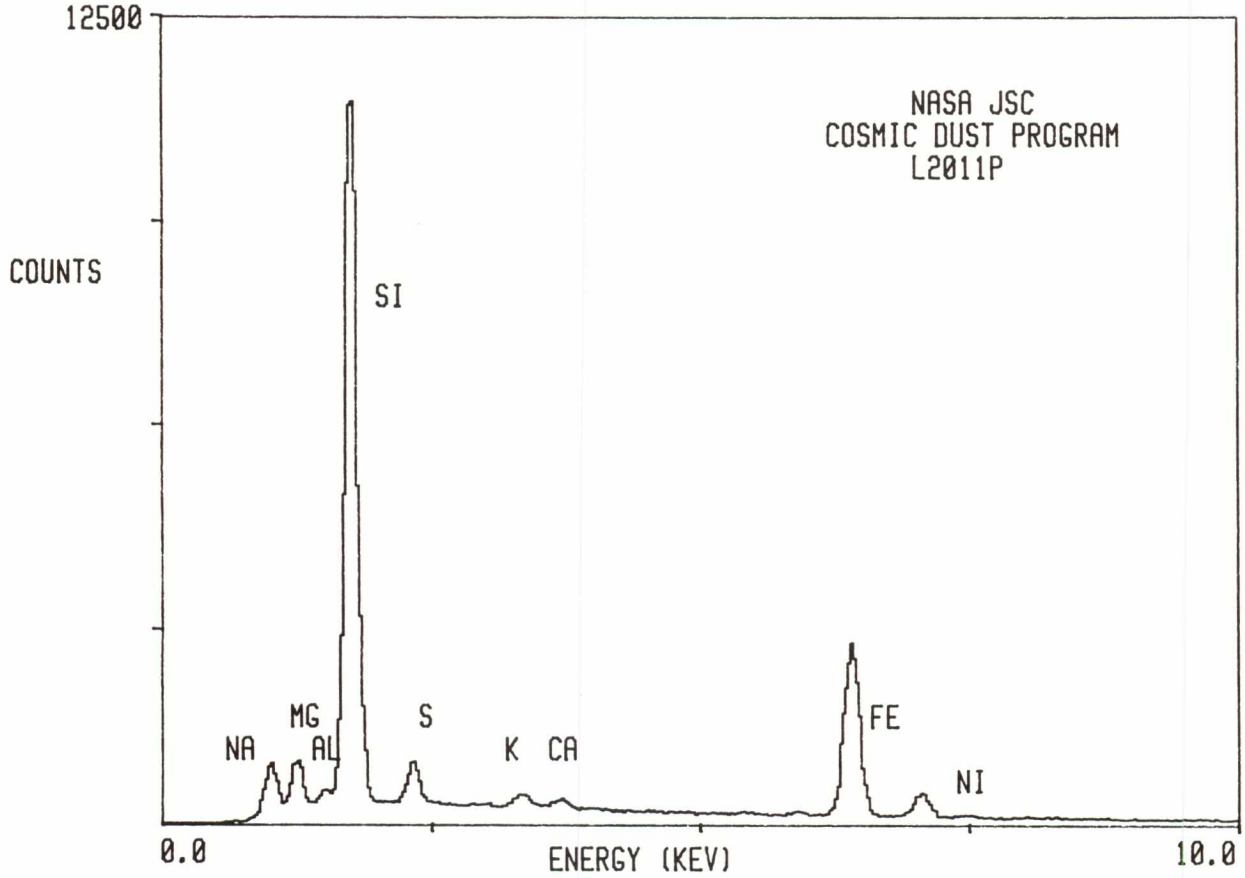
L2011 P 1



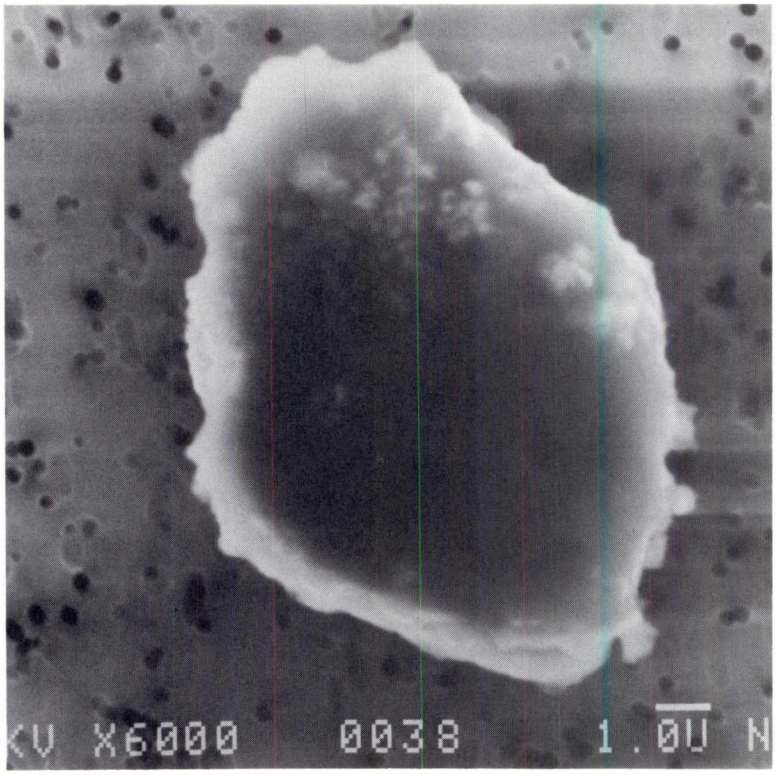
SIZE: 47x40
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: TCN

COMMENTS:

S-92-35262



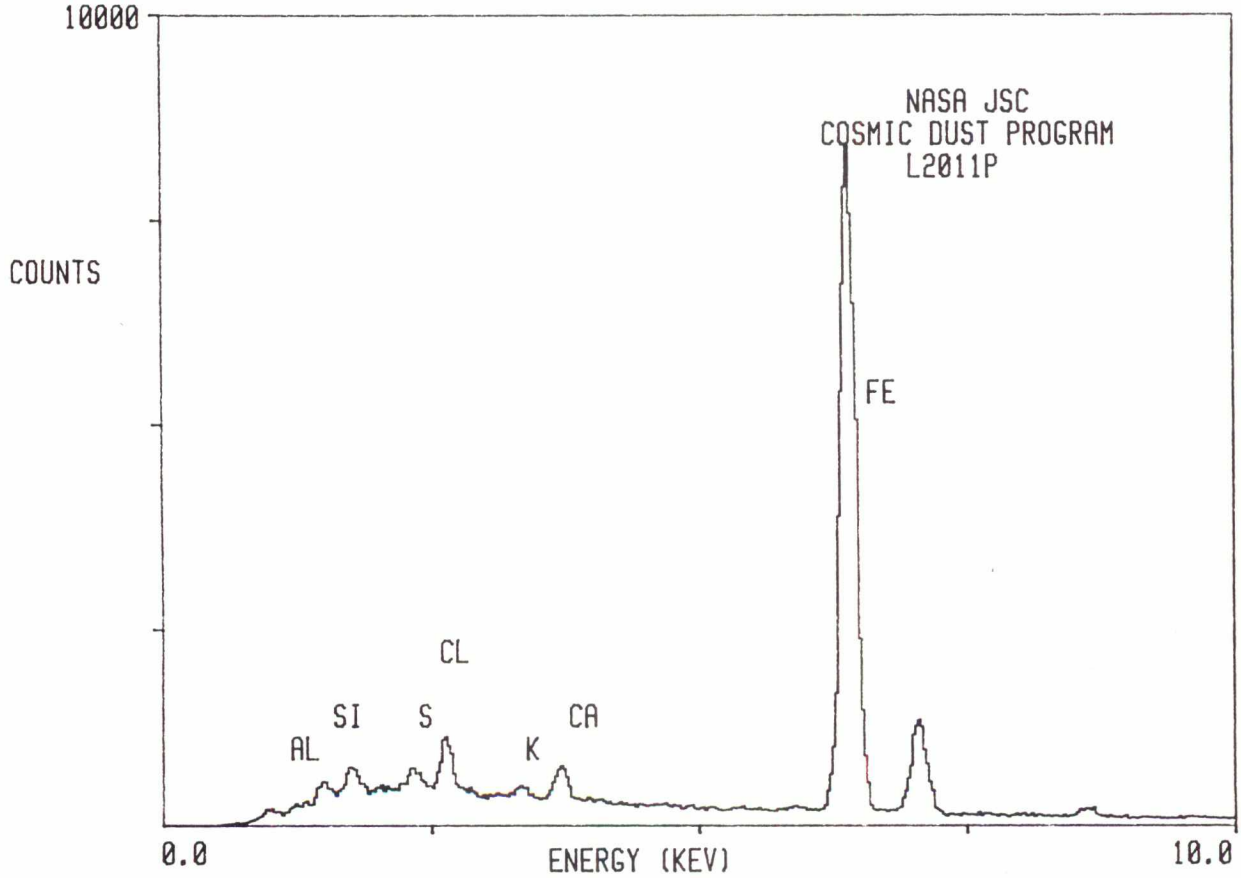
L2011 P 6



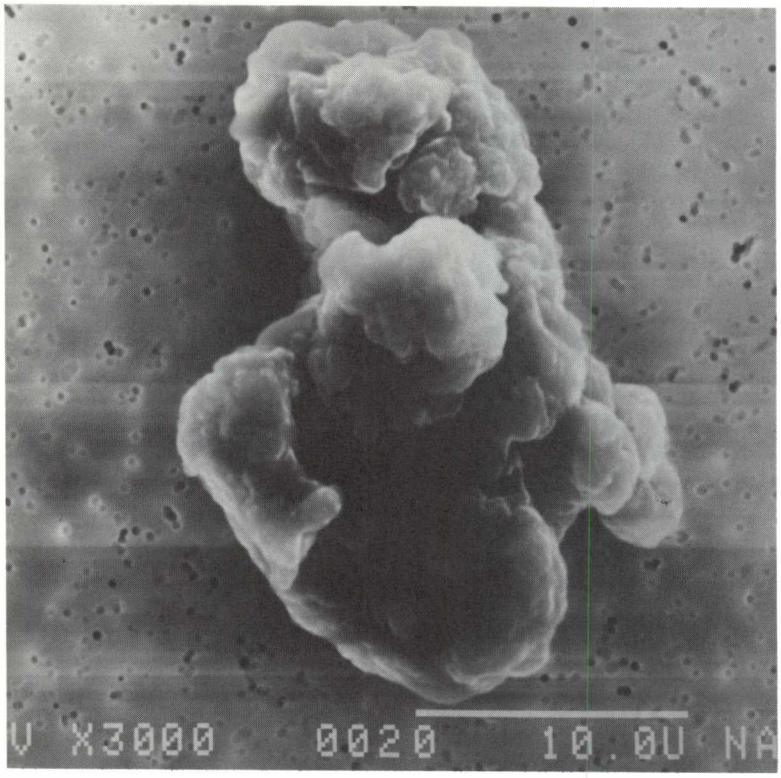
S-92-35267

SIZE: 13x10
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCN

COMMENTS:



L2011 Q 1



S-92-35248

SIZE: 26x22

SHAPE: I

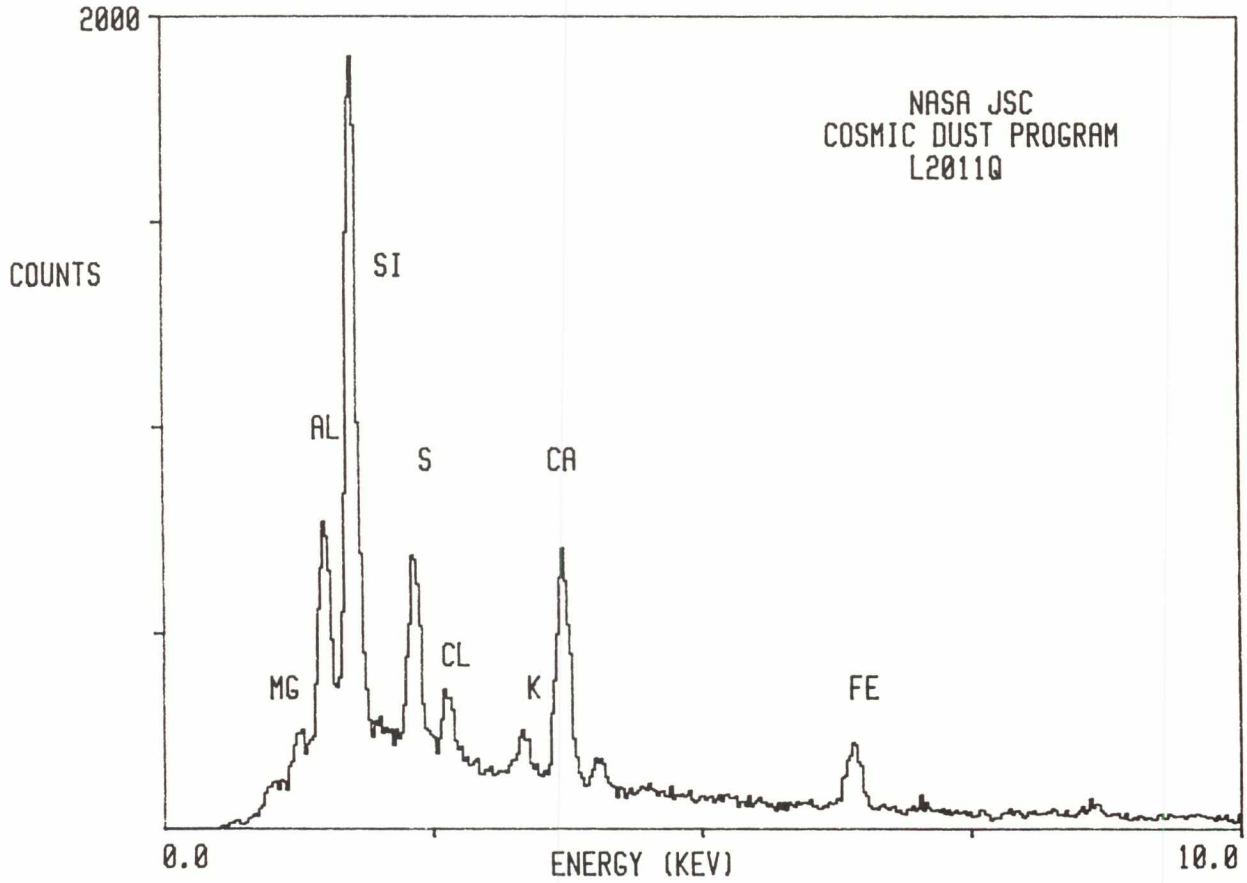
TRANS.: O

COLOR: Black to White

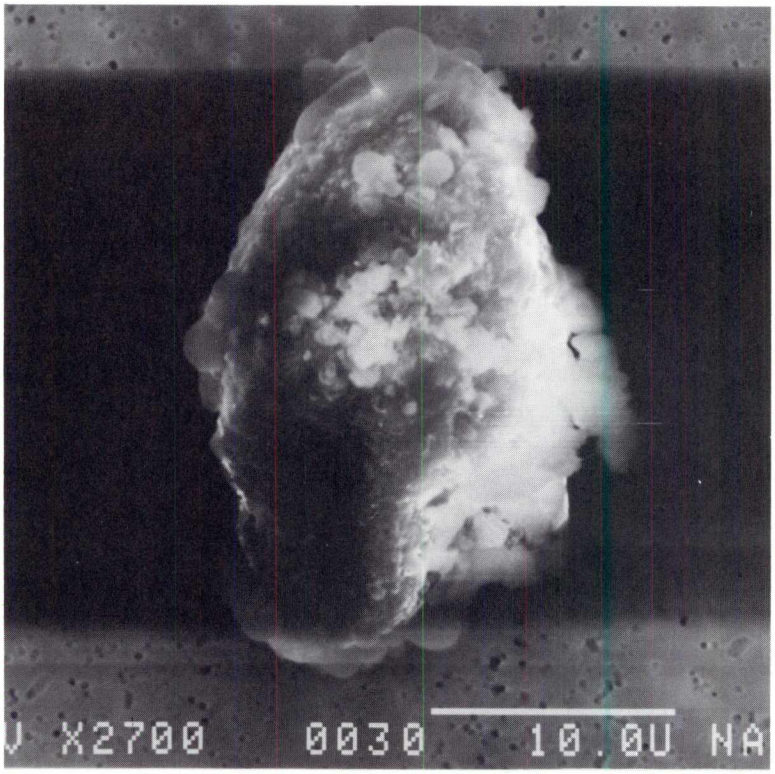
LUSTER: D

TYPE: TCN?

COMMENTS:



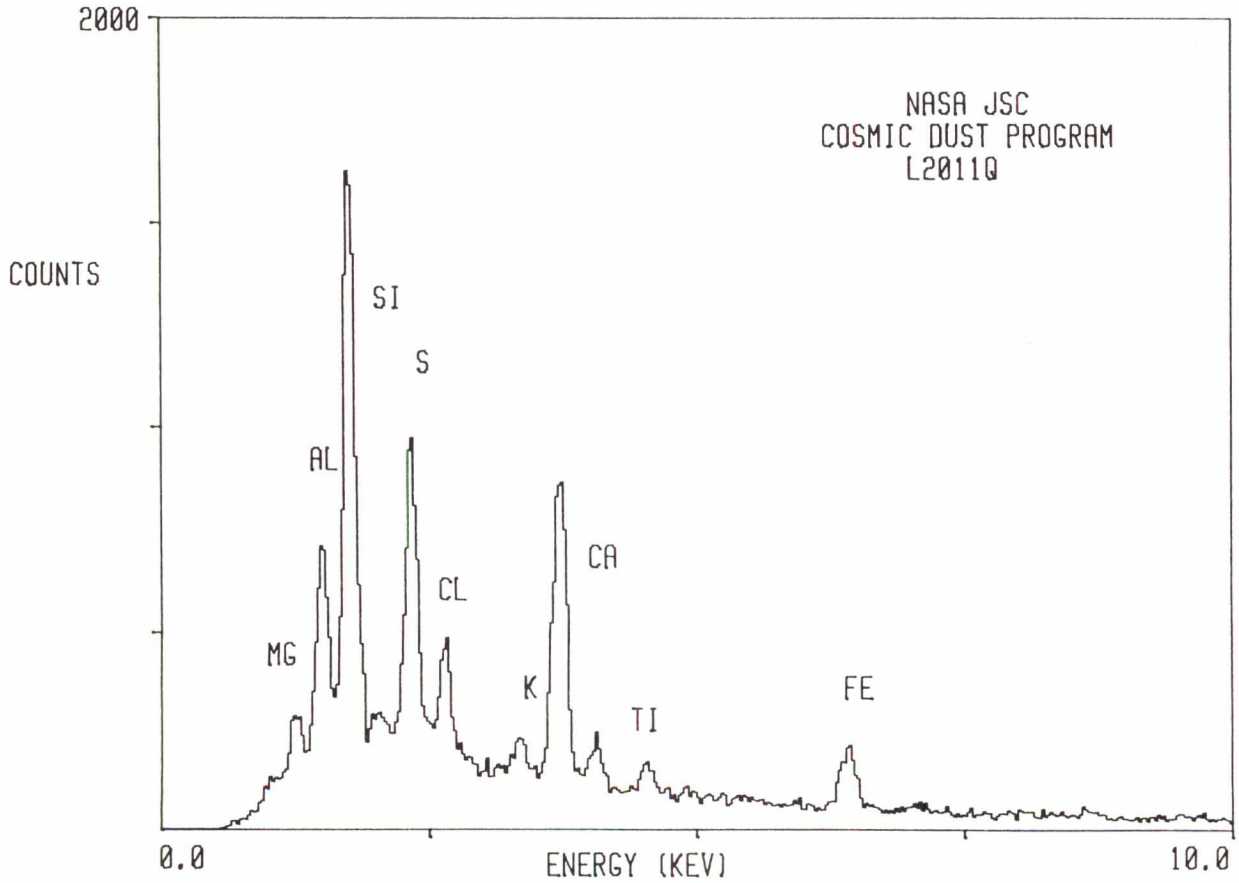
L2011 Q 6



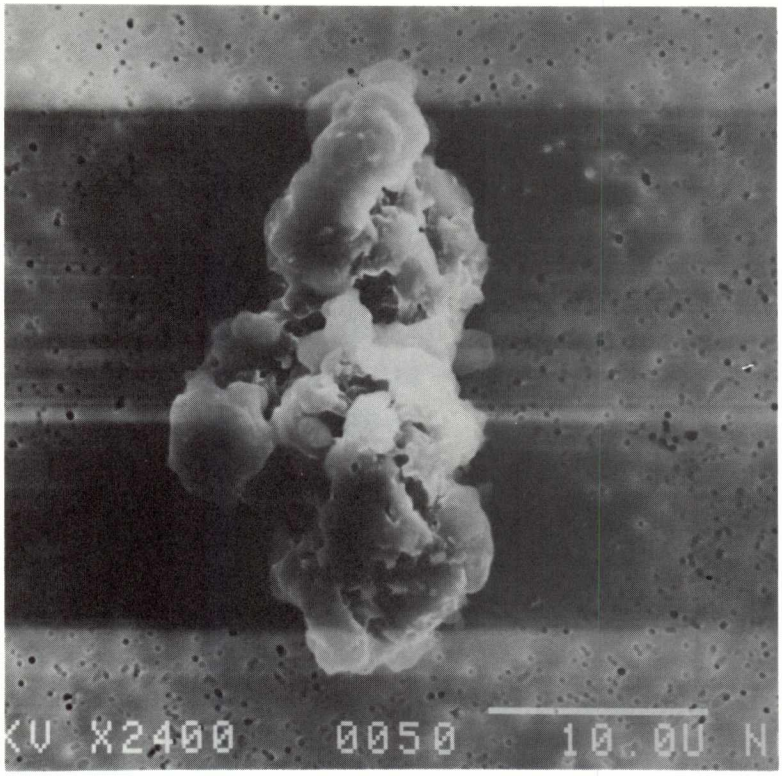
SIZE: 28x19
SHAPE: E
TRANS.: O
COLOR: Black to White
LUSTER: SM
TYPE: TCN

COMMENTS:

S-92-35253



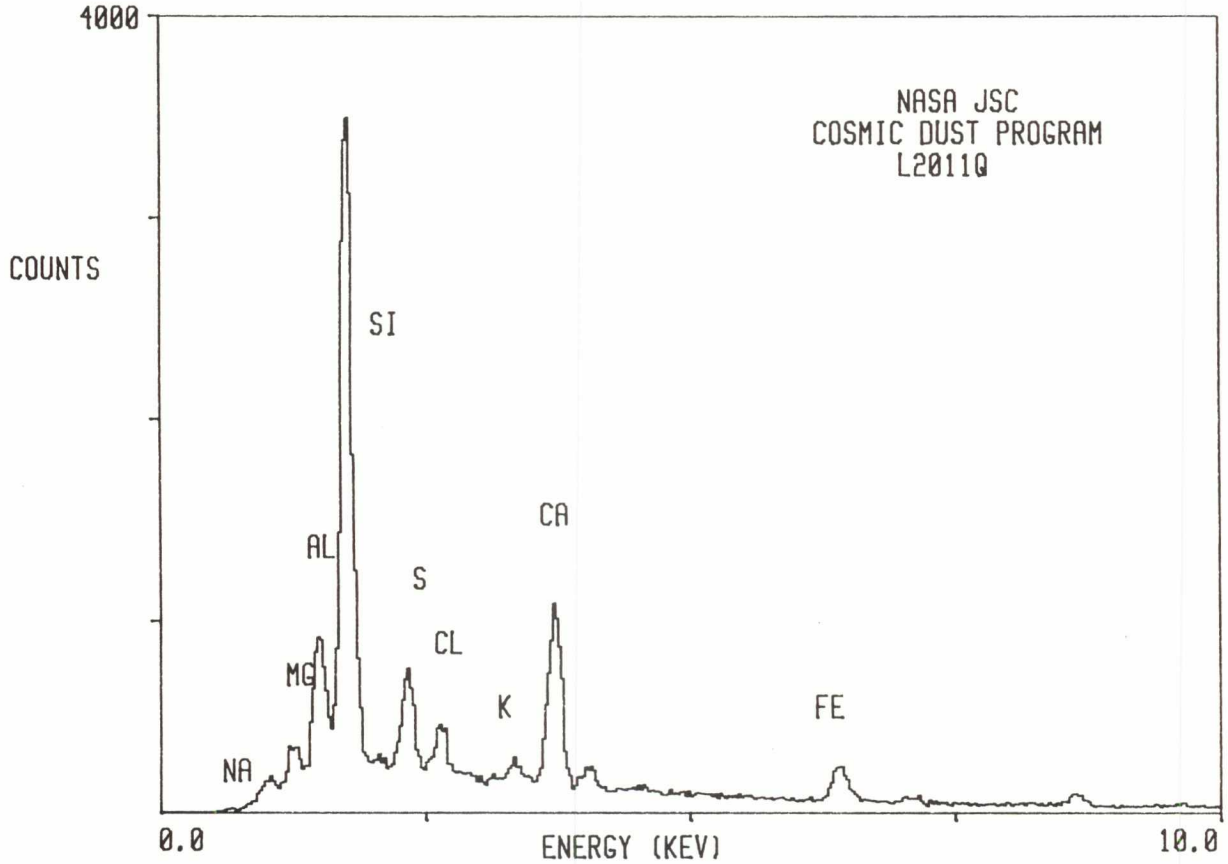
L2011 Q 14



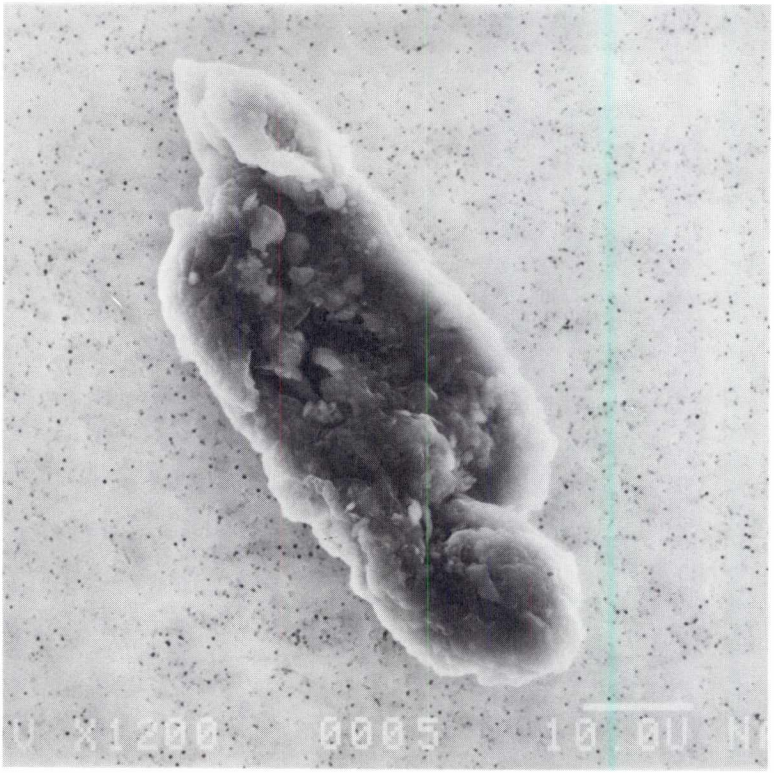
SIZE: 28x17
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCN

COMMENTS:

S-92-35261



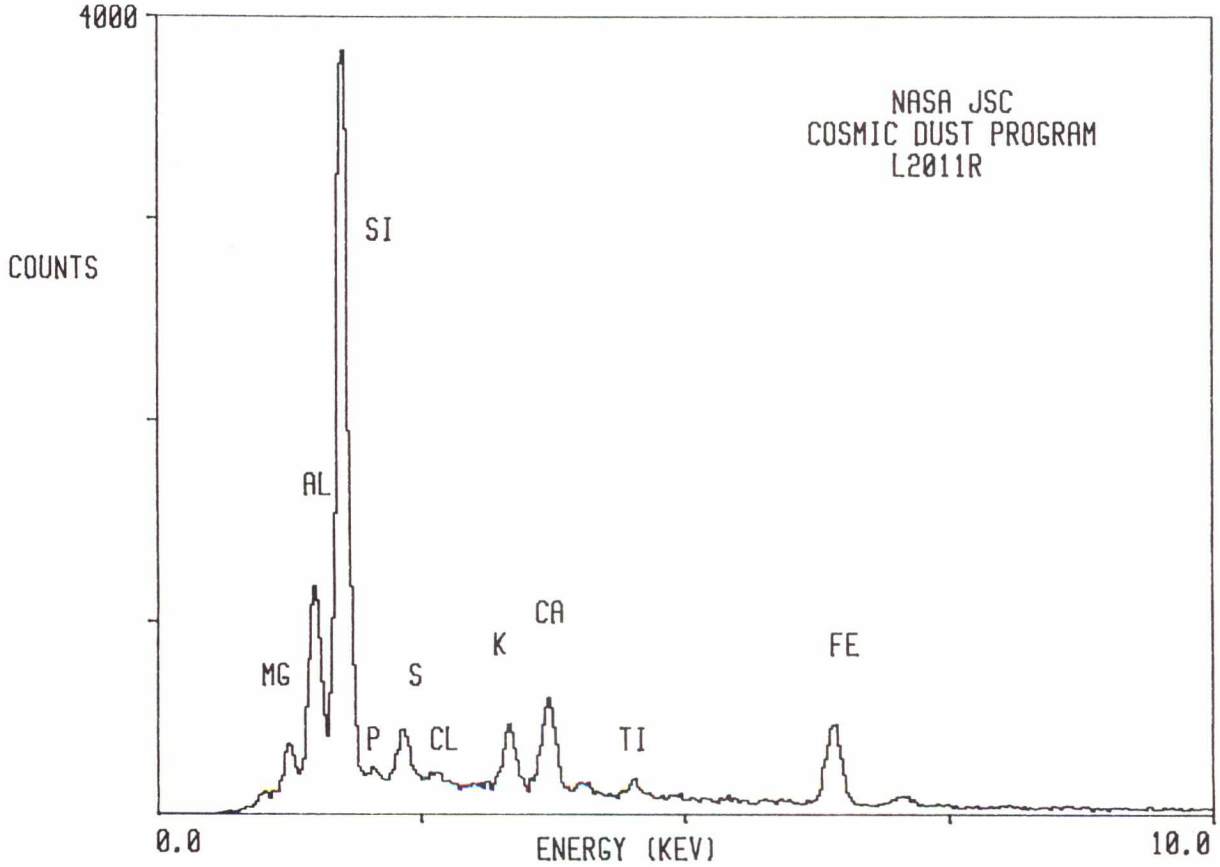
L2011 R 2



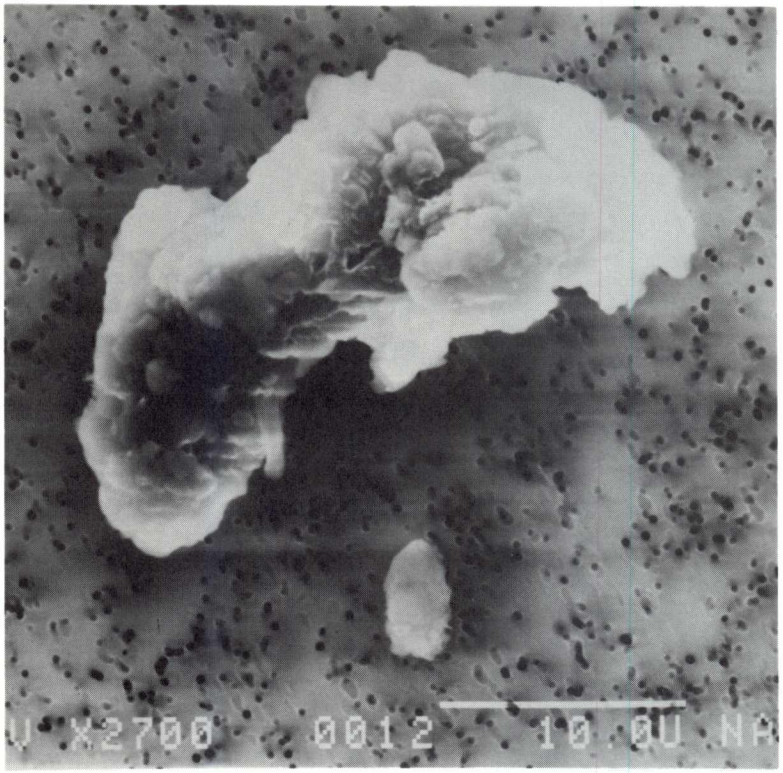
S-92-35235

SIZE: 66x26
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCN

COMMENTS:



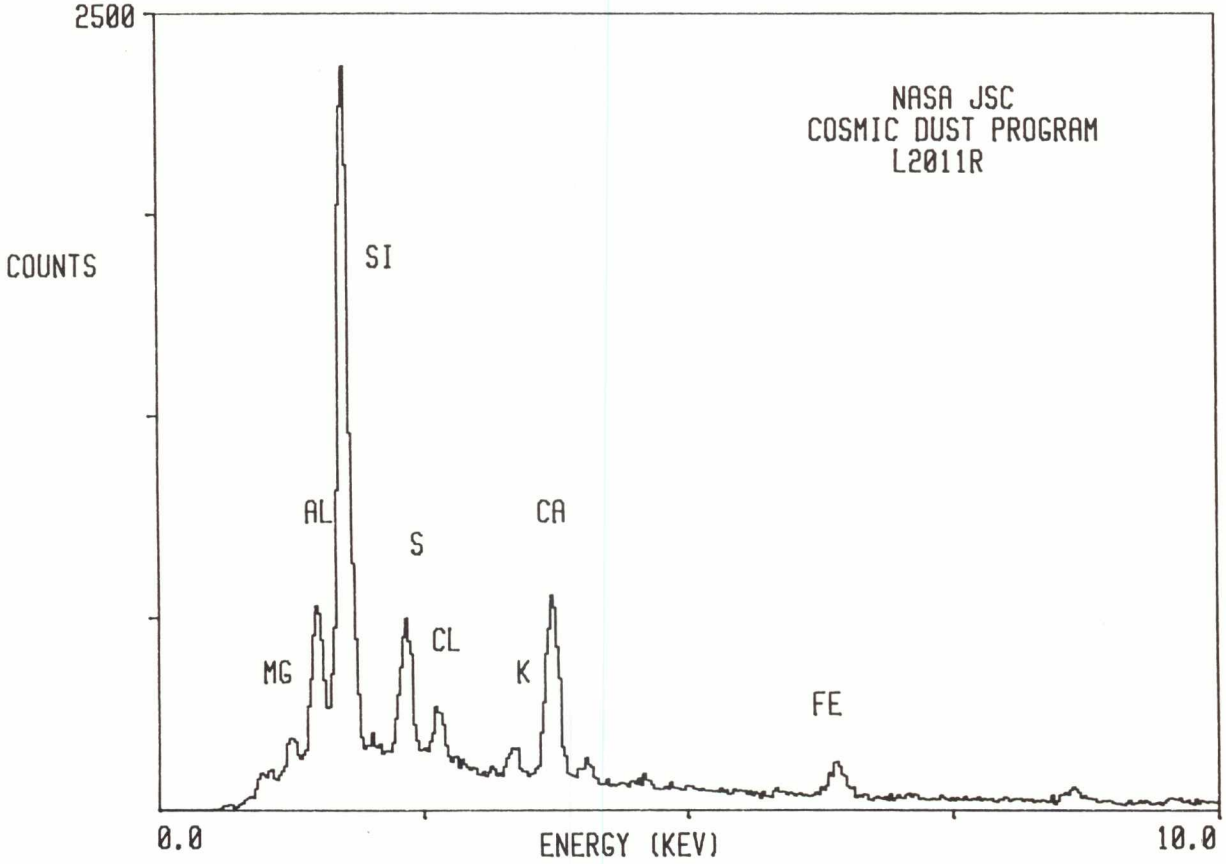
L2011 R 4



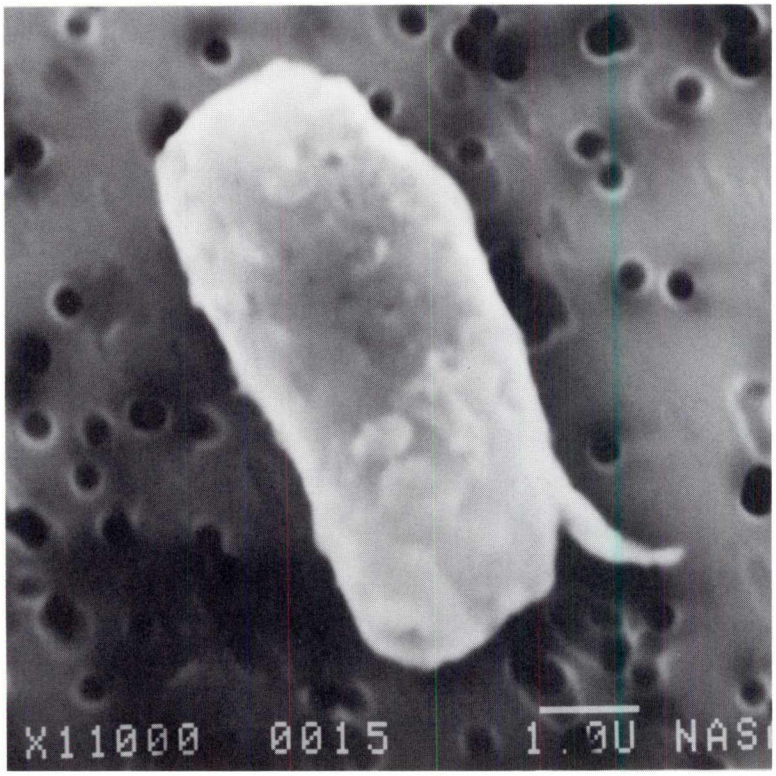
S-92-35237

SIZE: 28x13
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCN

COMMENTS:



L2011 R 6



SIZE: 10x6

SHAPE: I

TRANS.: O

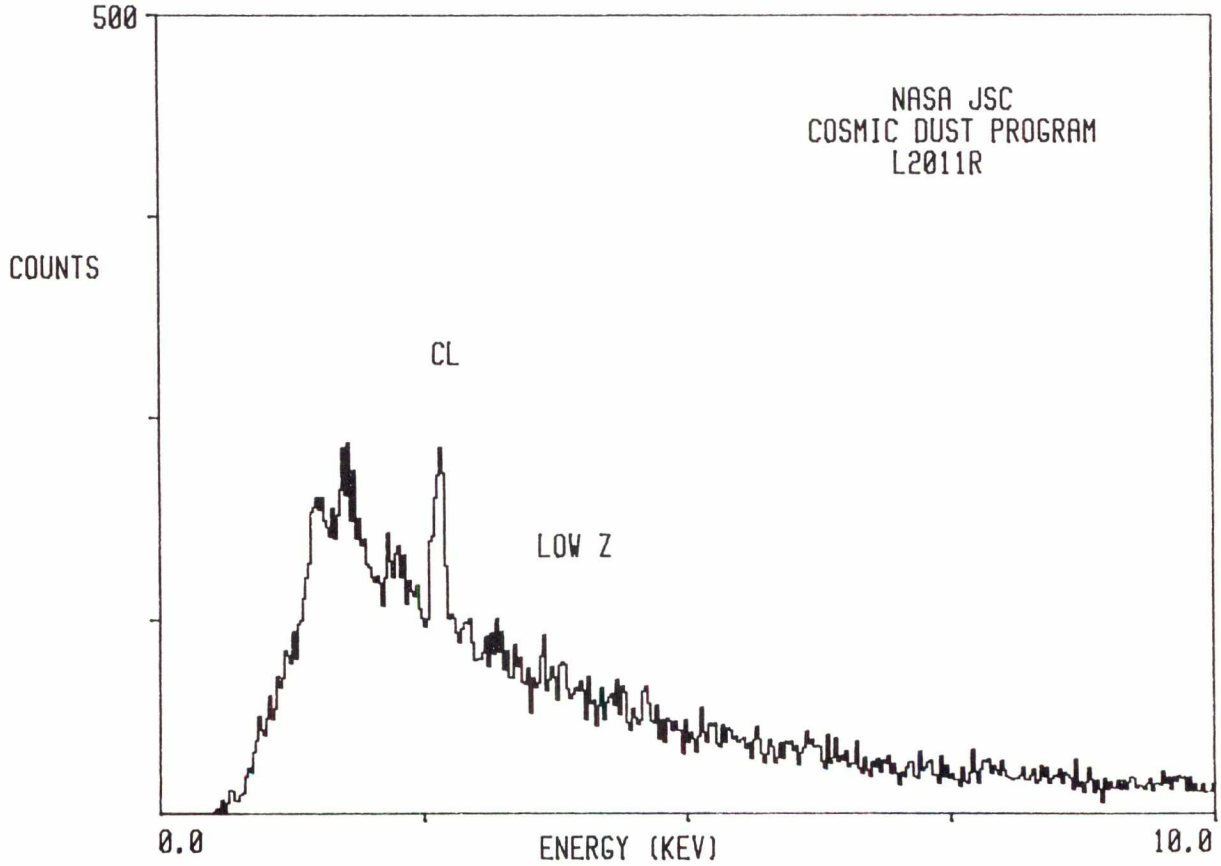
COLOR: Black

LUSTER: D

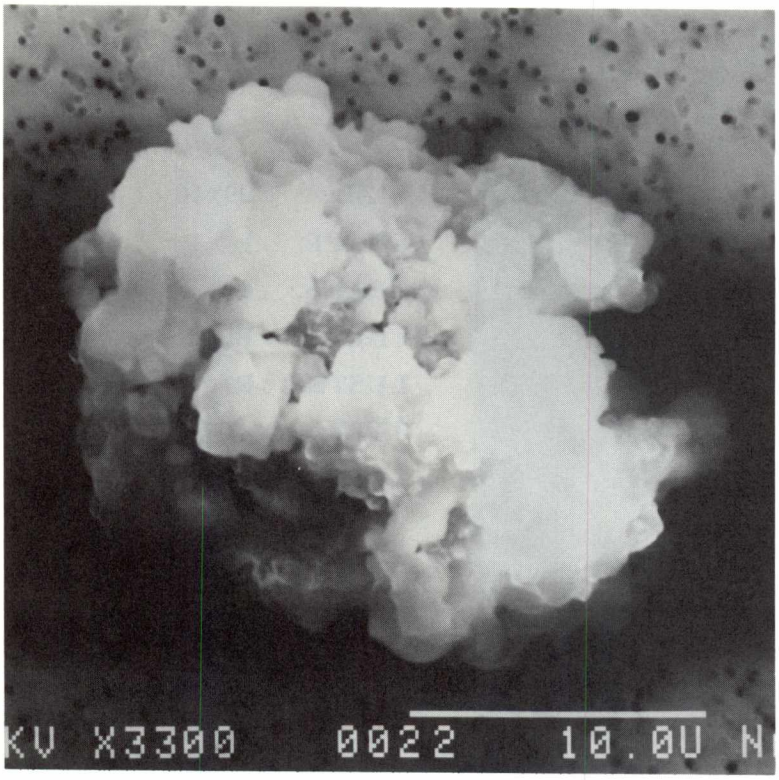
TYPE: TCN?

COMMENTS:

S-92-35239



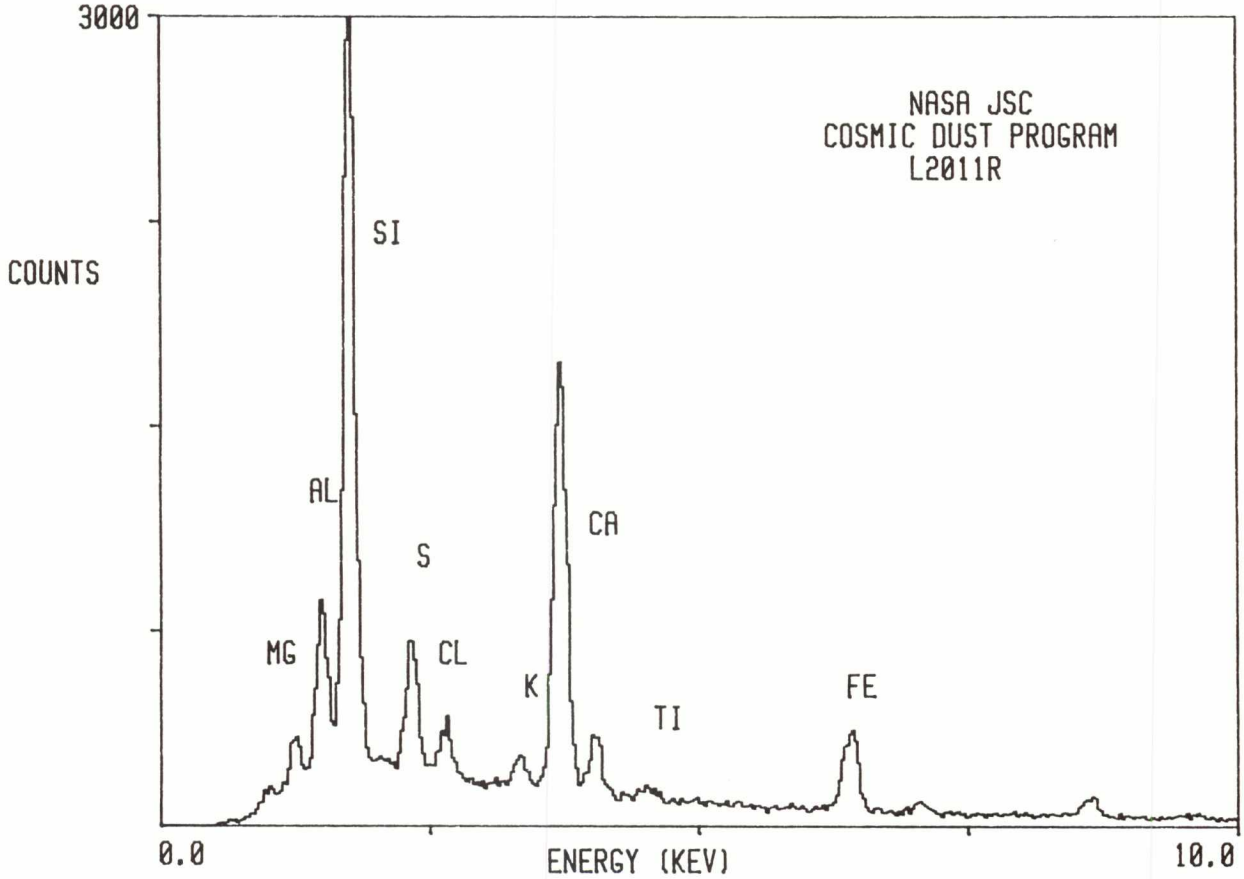
L2011 R 9



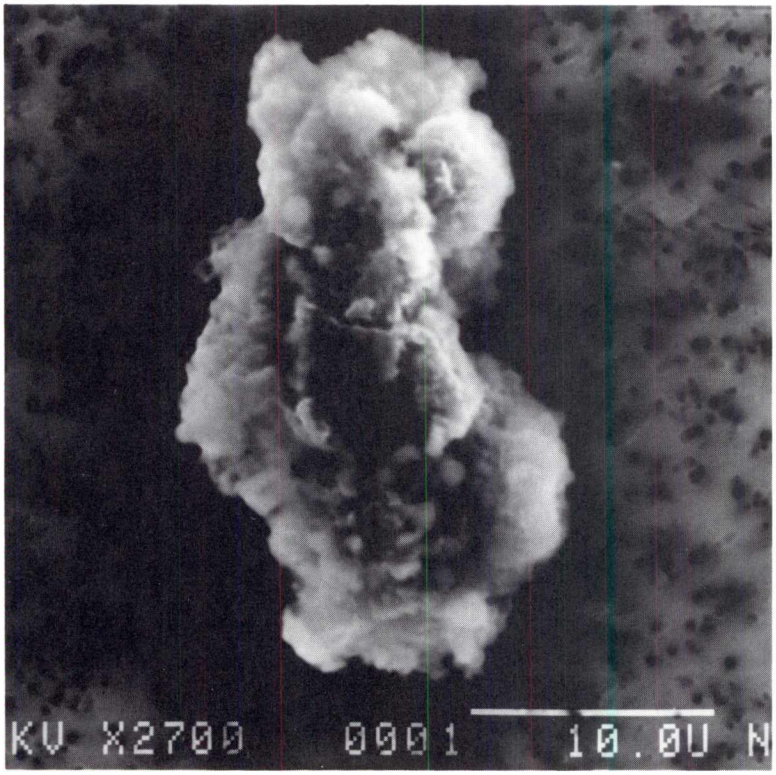
SIZE: 25x19
SHAPE: E
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCN?

COMMENTS:

S-92-35242



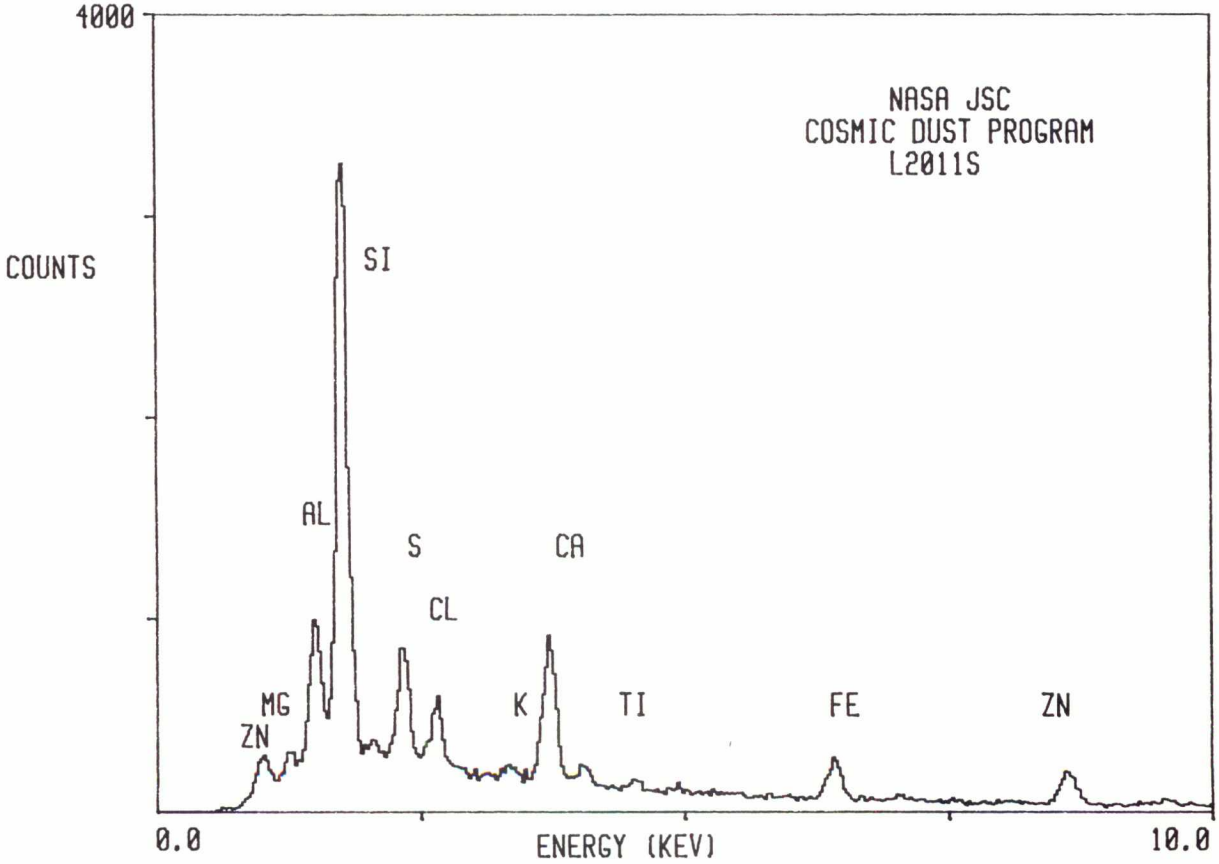
L2011 S 1



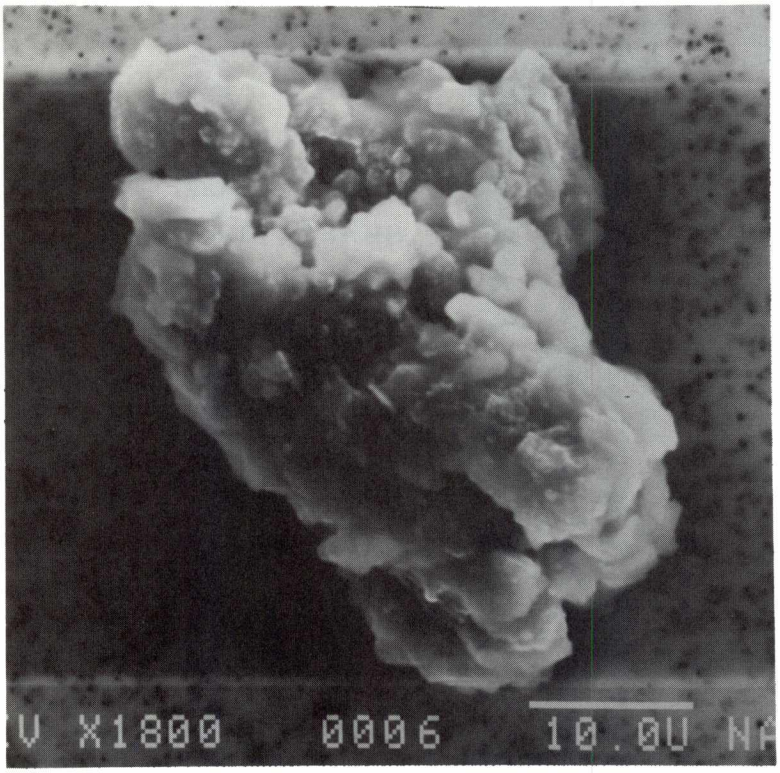
S-92-35220

SIZE: 29x16
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCN?

COMMENTS:



L2011 S 3



S-92-35222

SIZE: 48x33

SHAPE: I

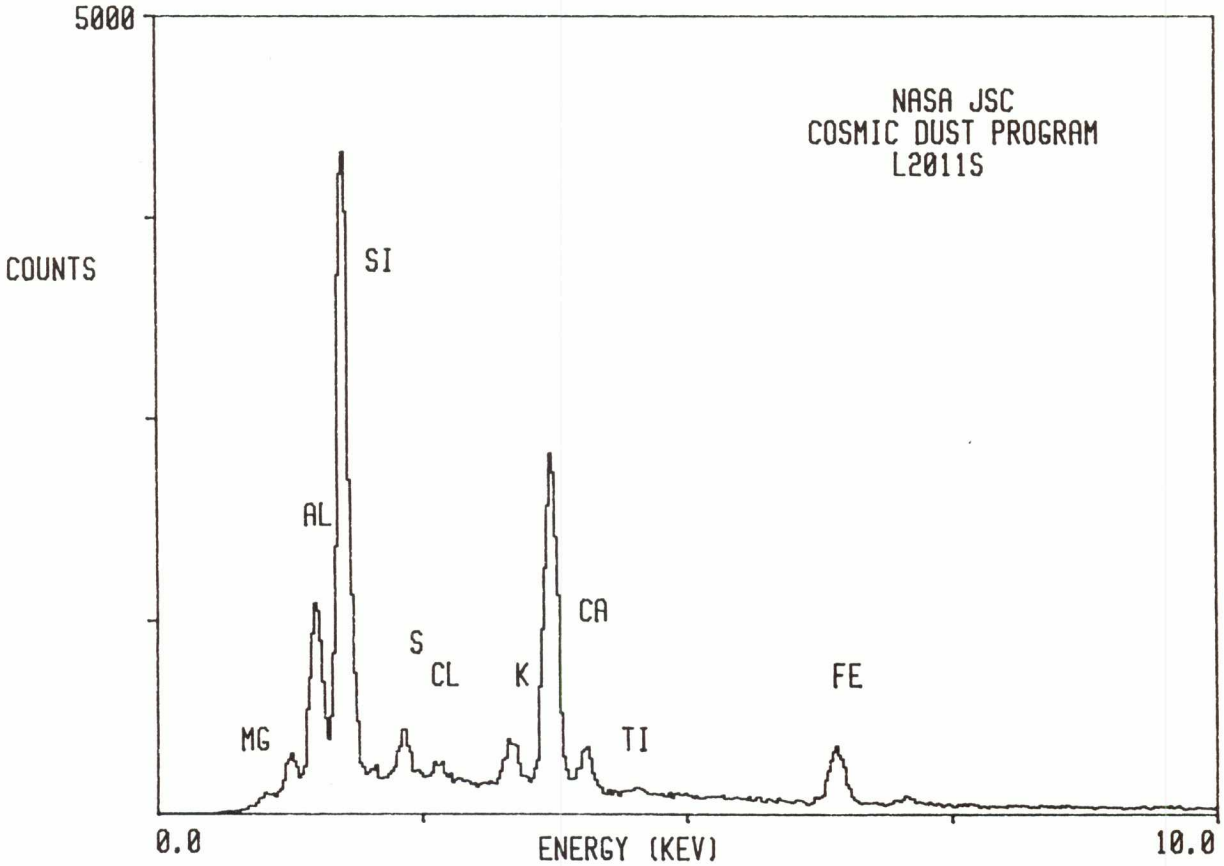
TRANS.: O

COLOR: Red to Black

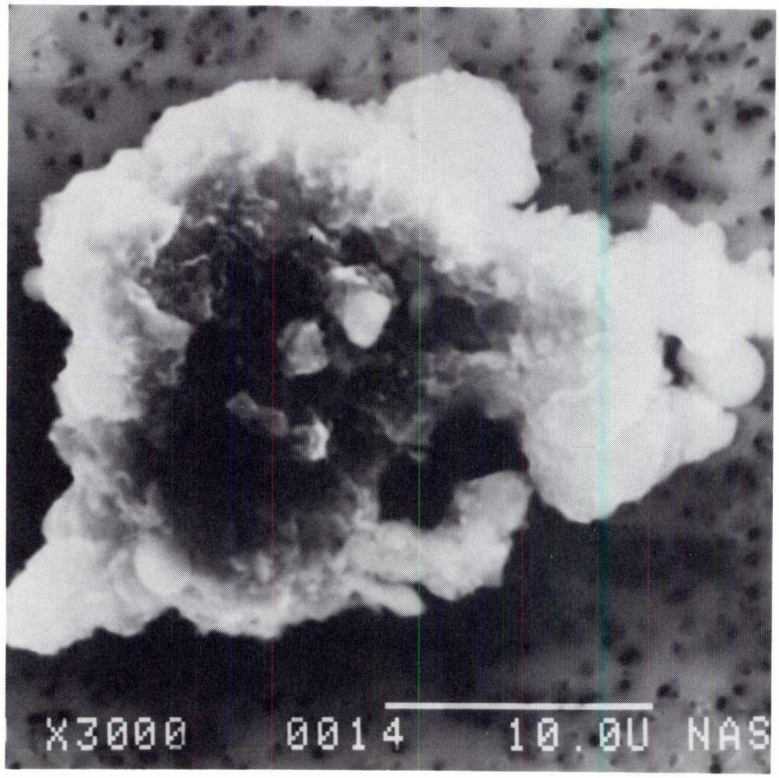
LUSTER: SM

TYPE: TCN

COMMENTS:



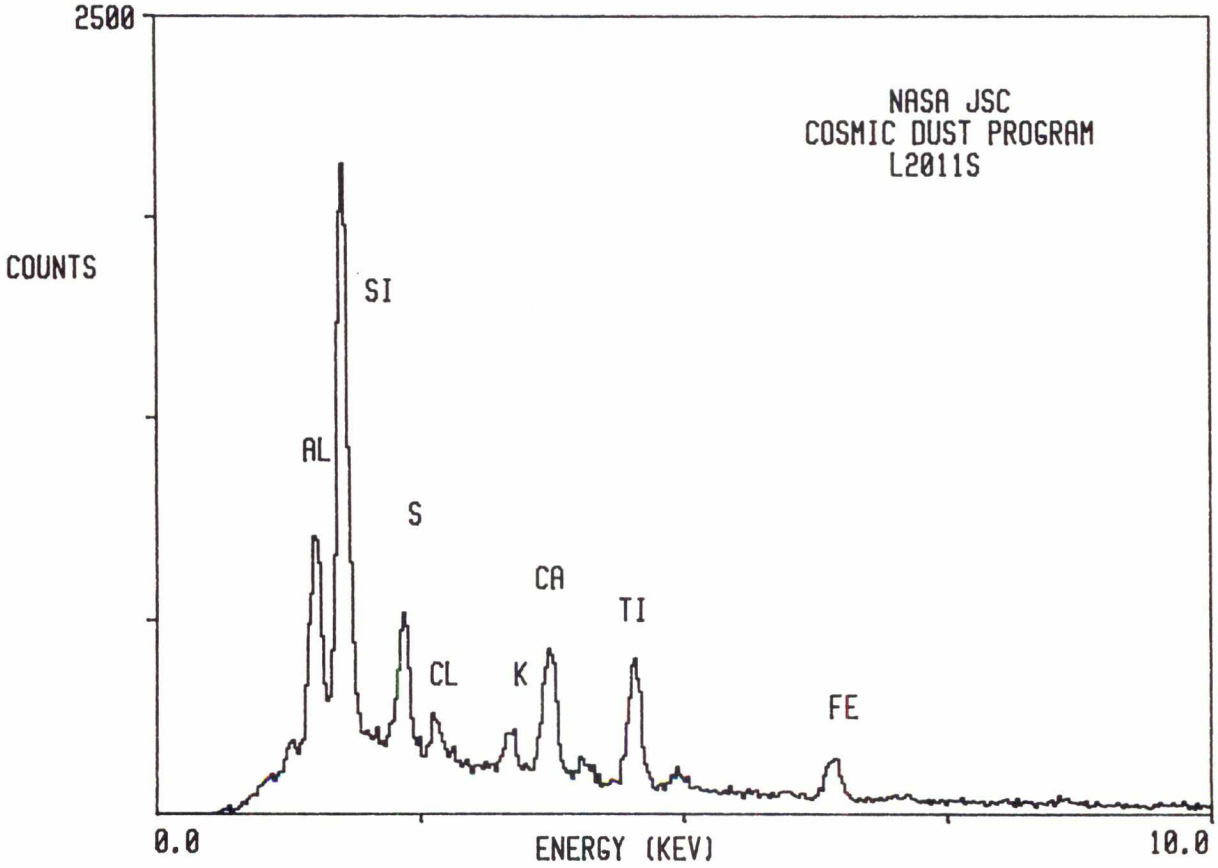
L2011 S 6



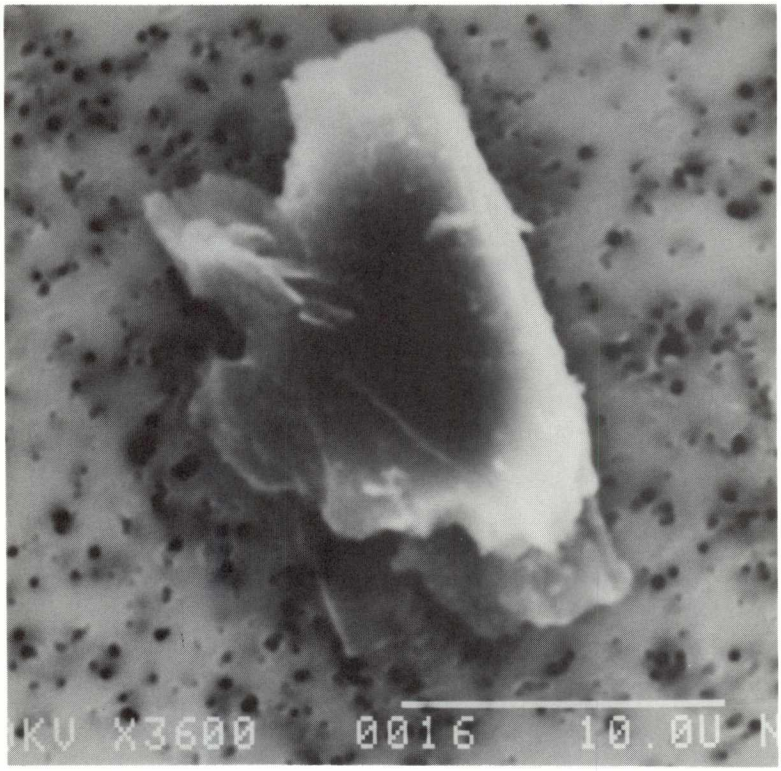
SIZE: 34x22
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: M
TYPE: TCN

COMMENTS:

S-92-35225



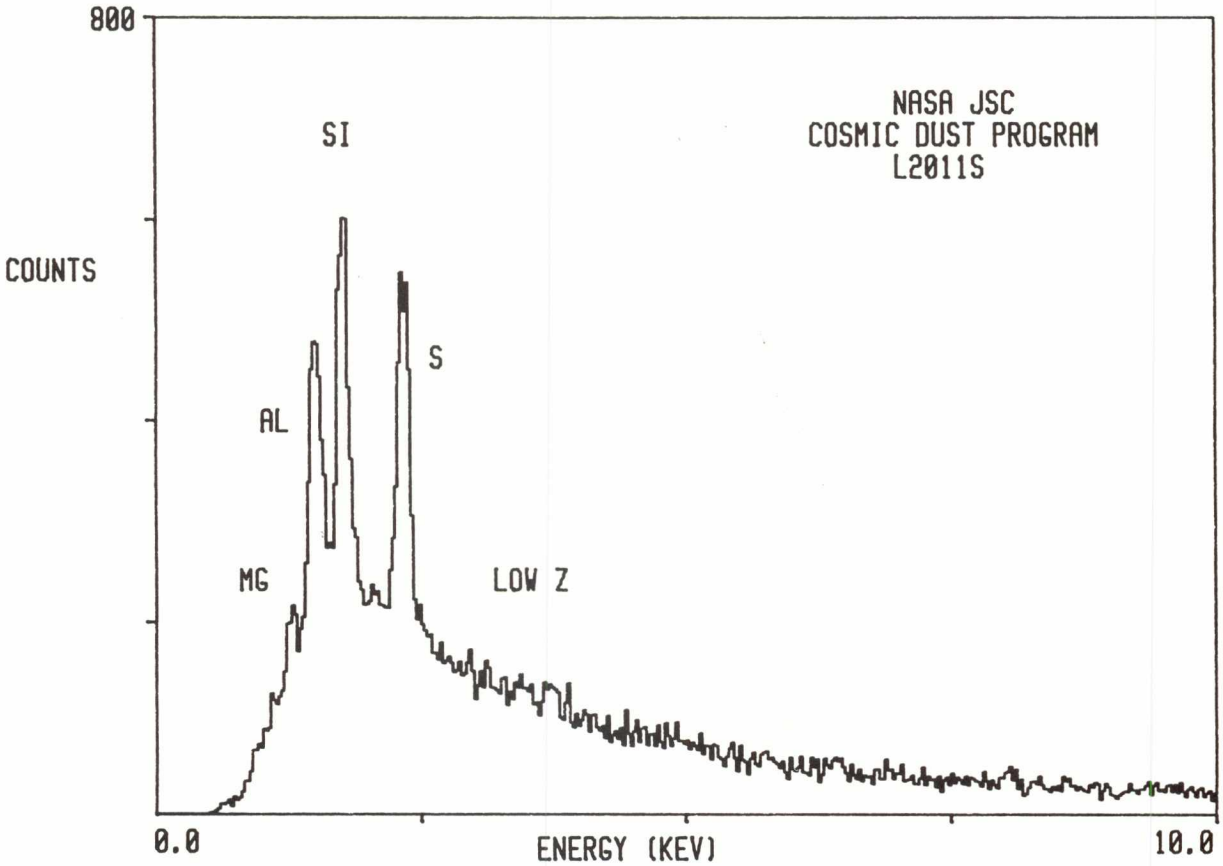
L2011 S 7



SIZE: 18x12
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: R
TYPE: TCN?

COMMENTS:

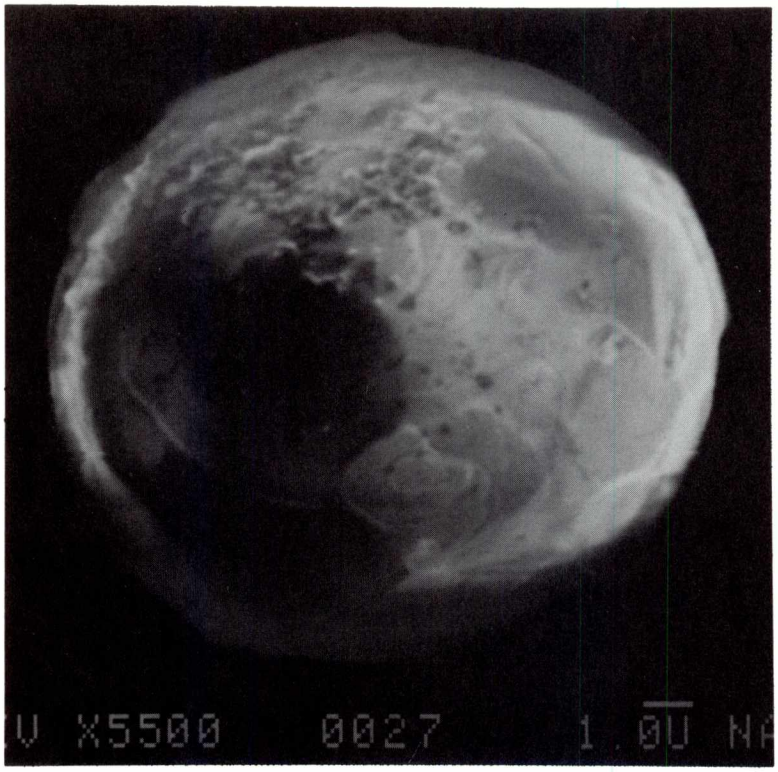
S-92-35226



Particle Descriptions

AOS Type

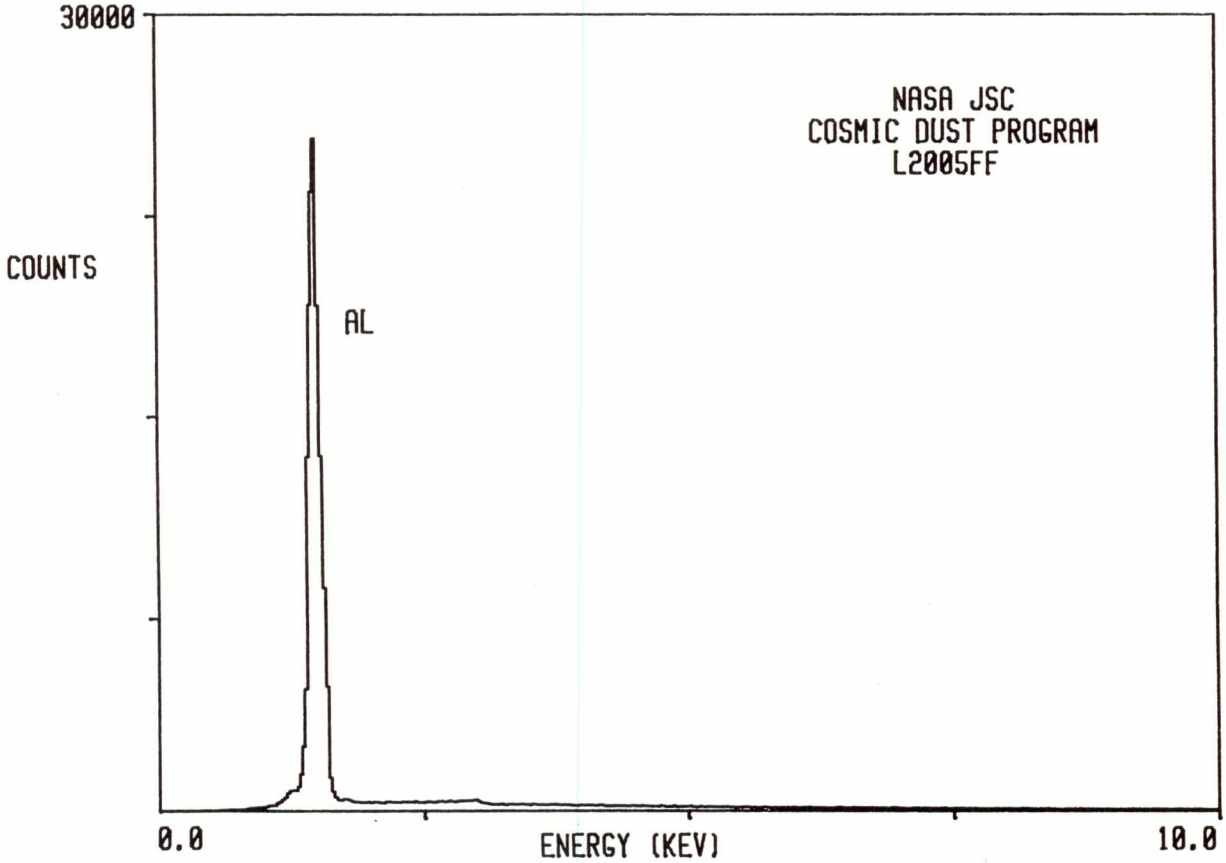
L2005 AF 17



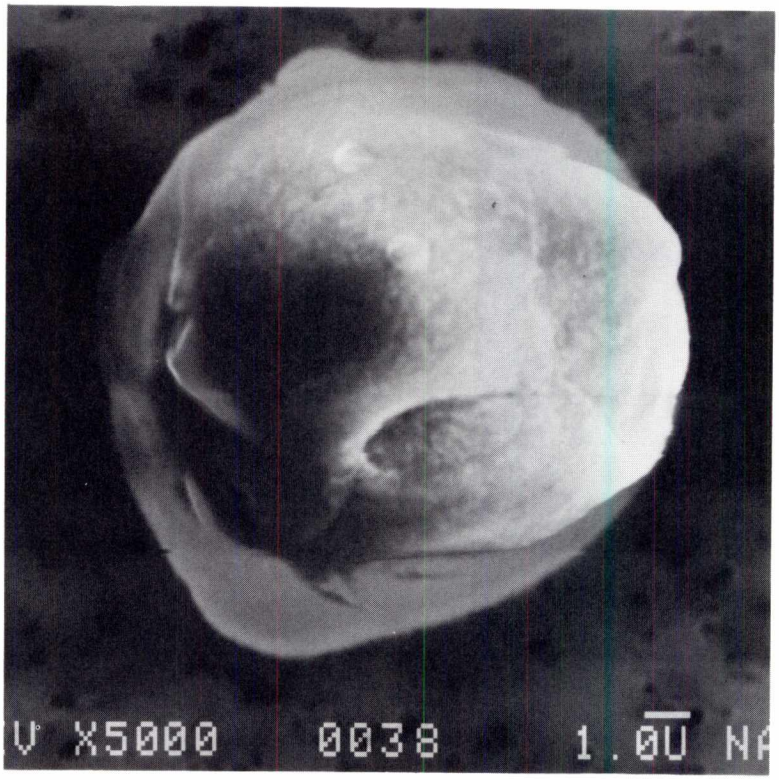
SIZE: 12
SHAPE: S
TRANS.: TL
COLOR: Colorless
LUSTER: V
TYPE: AOS

COMMENTS:

S-92-35396



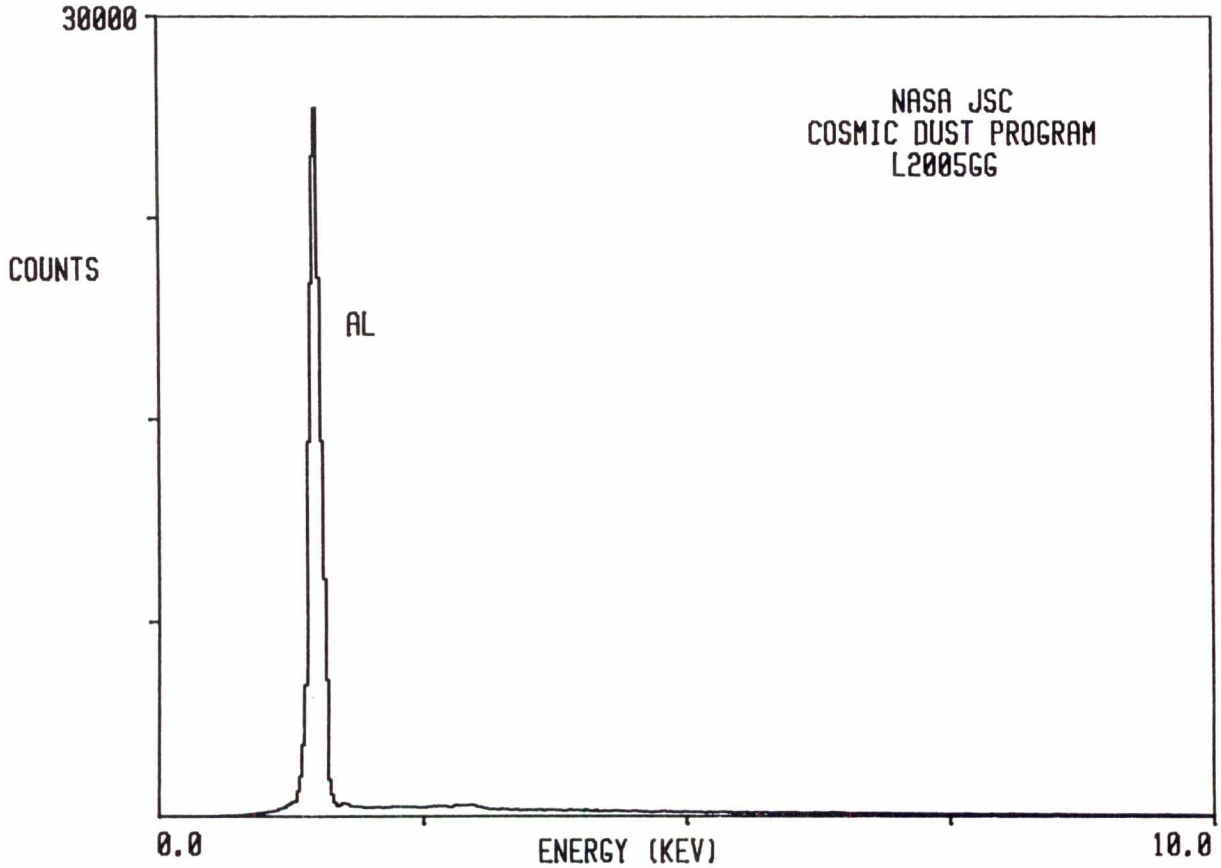
L2005 AG 1



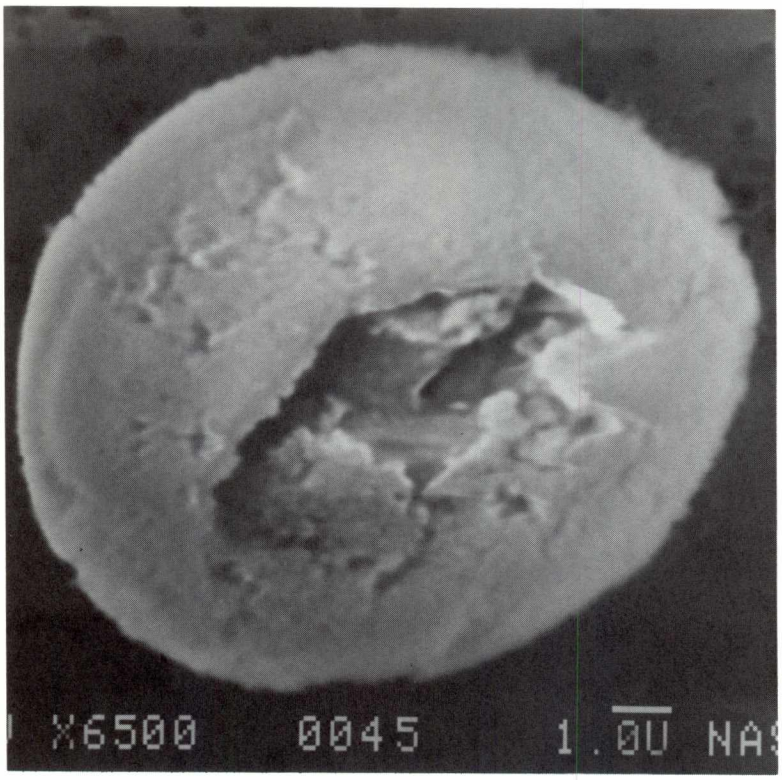
S-92-35363

SIZE: 14
SHAPE: S
TRANS.: TL
COLOR: White
LUSTER: D
TYPE: AOS

COMMENTS:



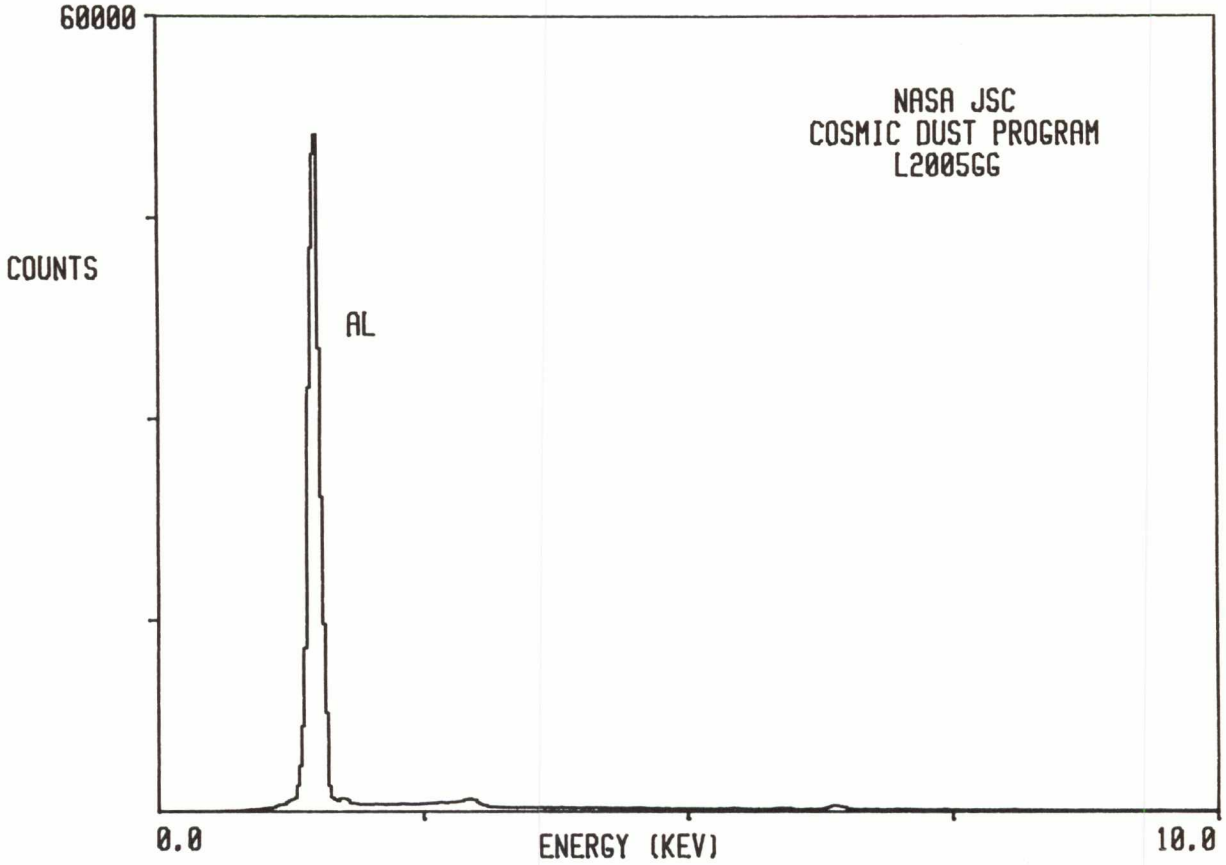
L2005 AG 5



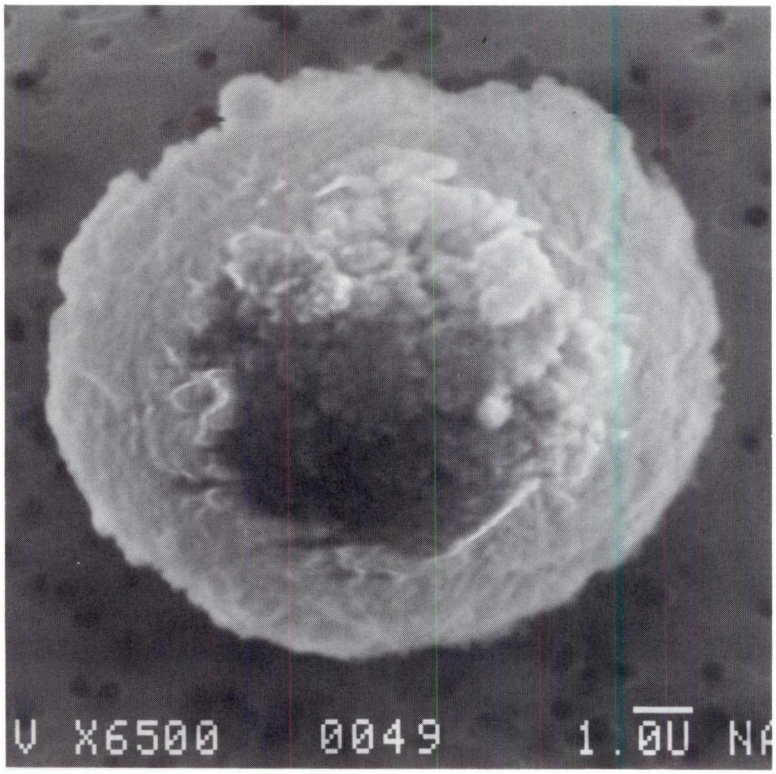
S-92-35367

SIZE: 12
SHAPE: S
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: AOS

COMMENTS:



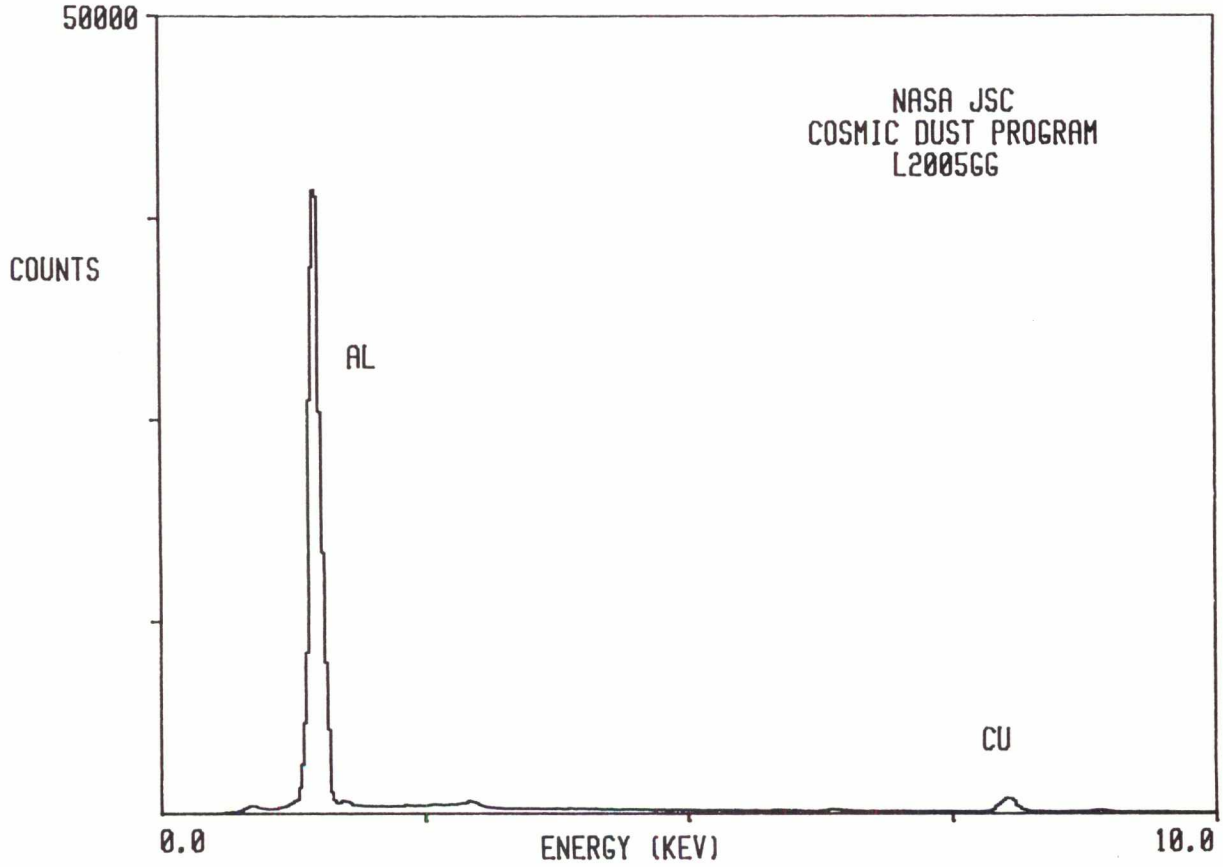
L2005 AG 7



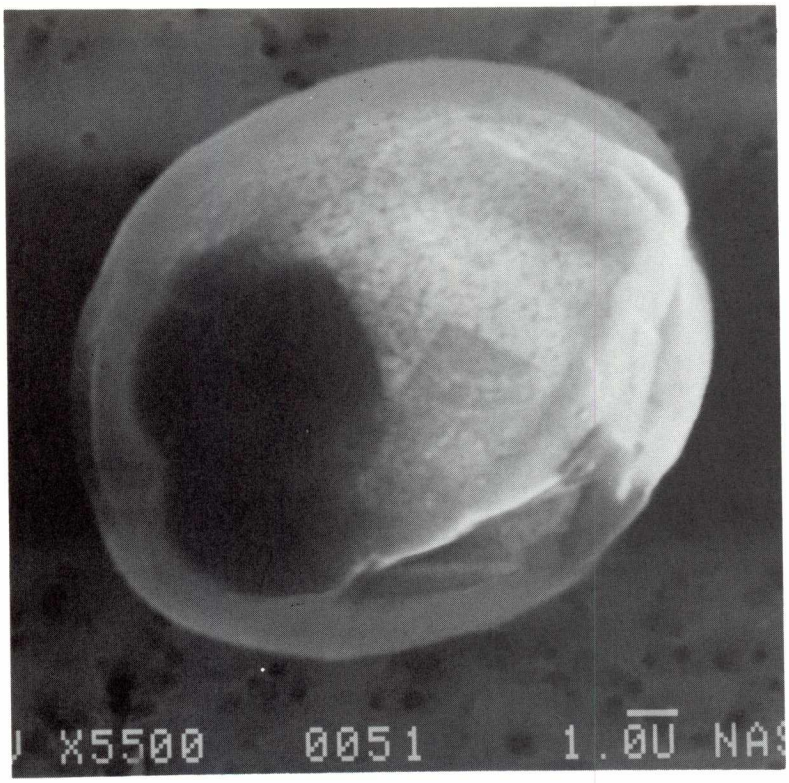
SIZE: 10
SHAPE: S
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: AOS

COMMENTS:

S-92-35369



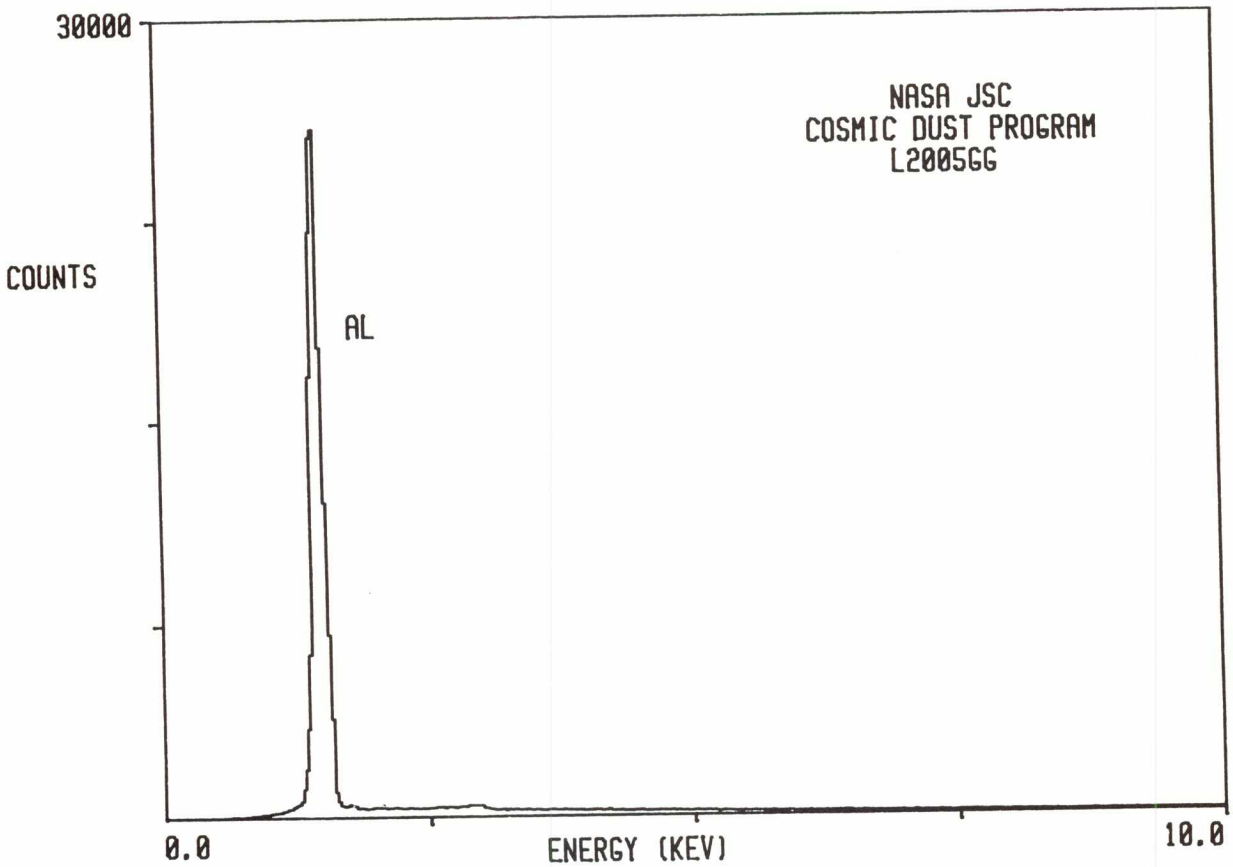
L2005 AG 8



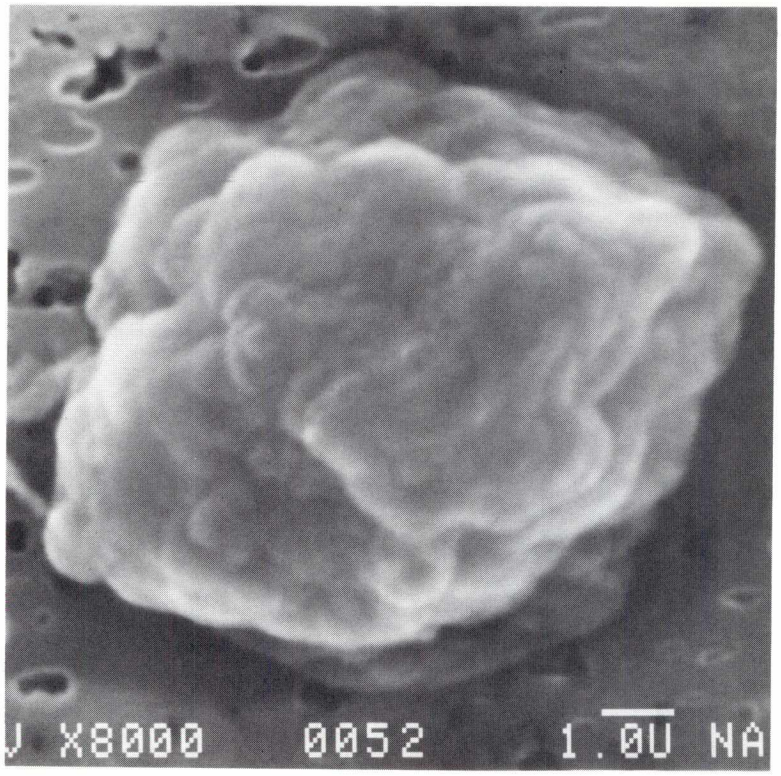
SIZE: 14
SHAPE: S
TRANS.: TL
COLOR: Colorless
LUSTER: V
TYPE: AOS

COMMENTS:

S-92-35370



L2005 AG 9



S-92-35371

SIZE: 10

SHAPE: S

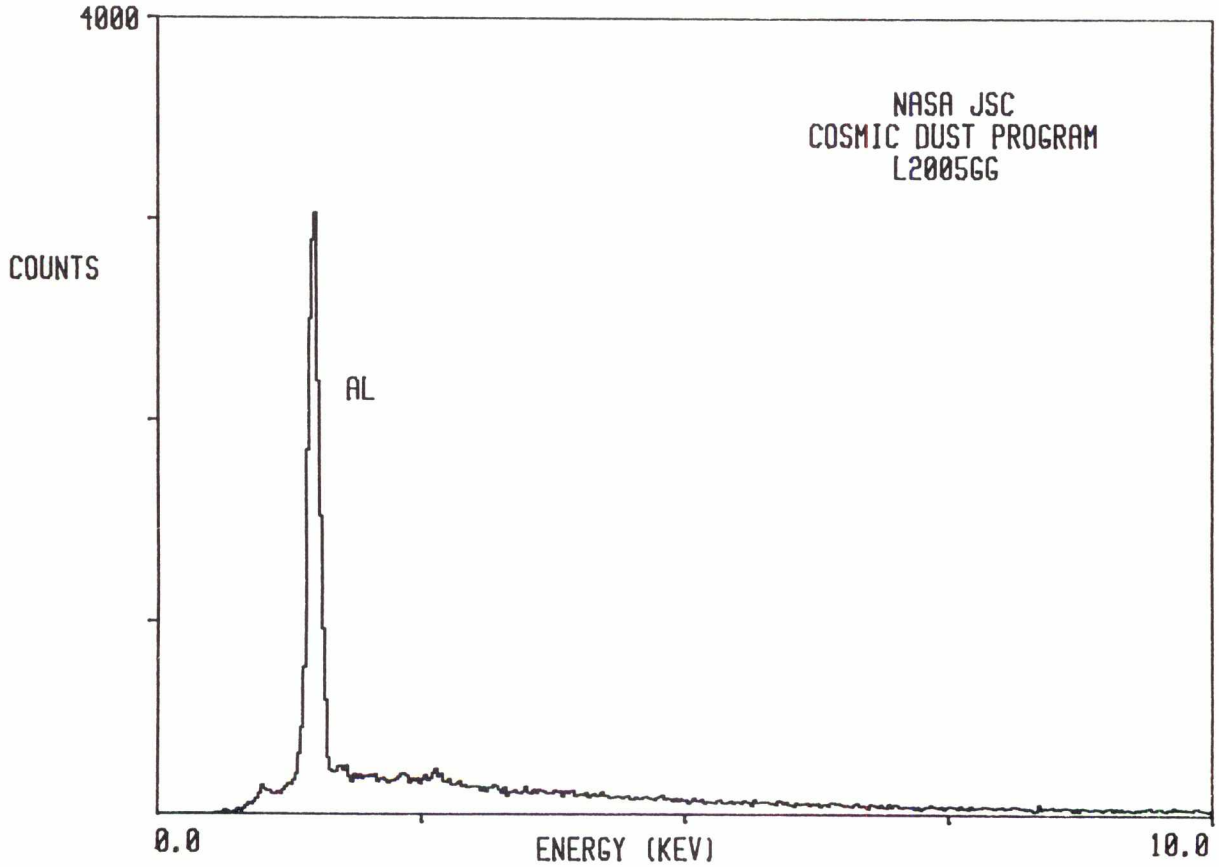
TRANS.: O

COLOR: Silver

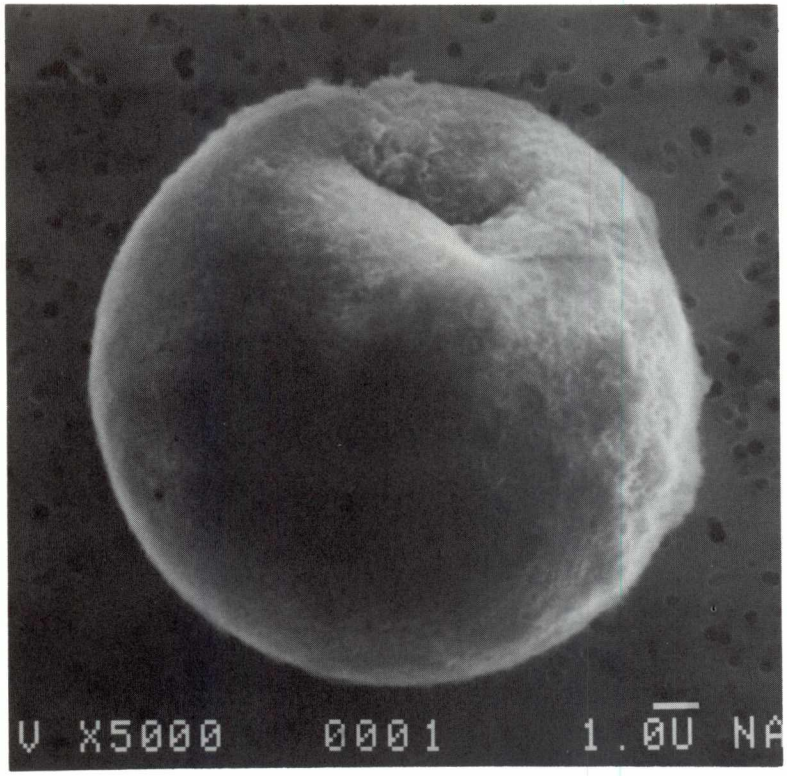
LUSTER: M

TYPE: AOS

COMMENTS:



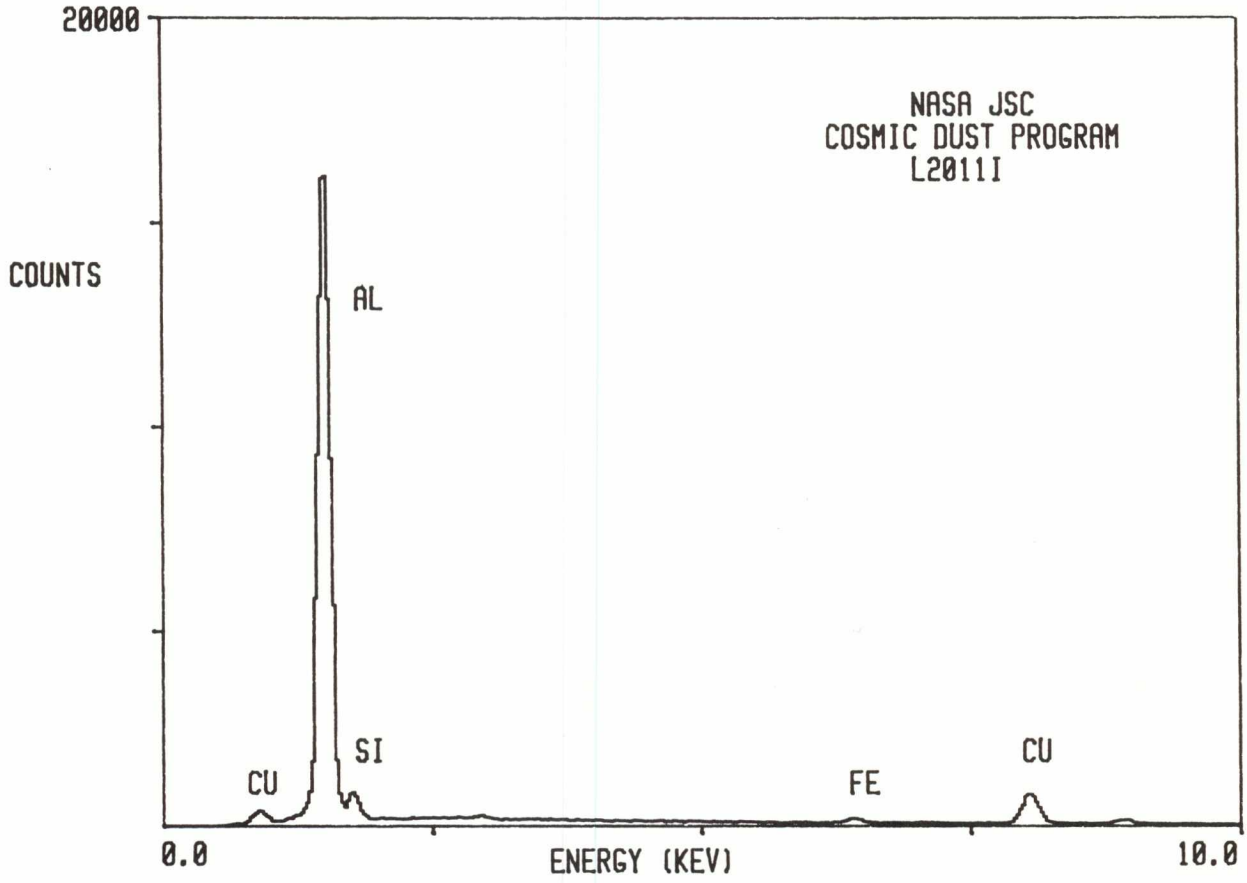
L2011 I 1



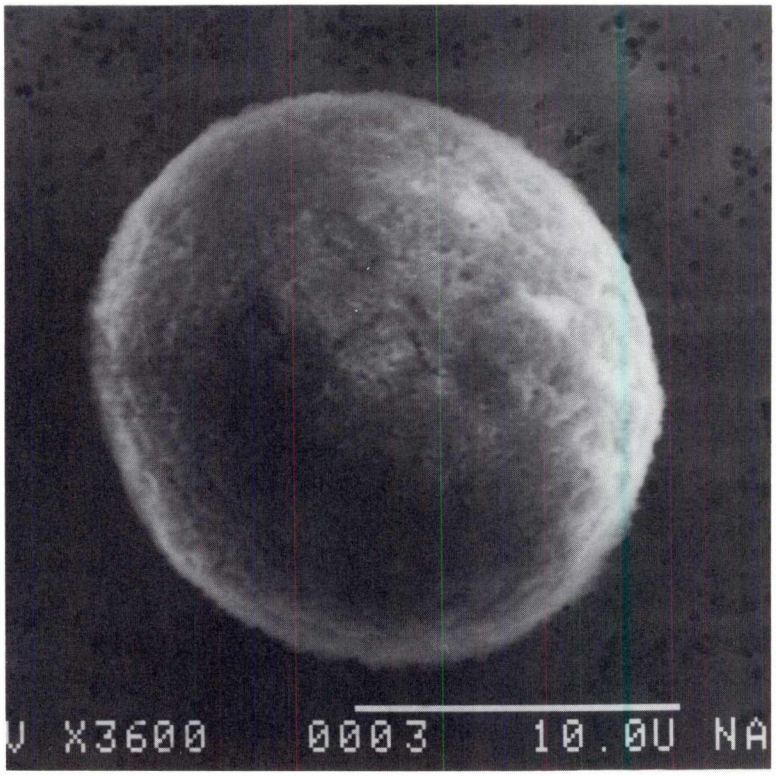
S-92-35815

SIZE: 13
SHAPE: S
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: AOS

COMMENTS:



L2011 I 2



S-92-35816

SIZE: 18

SHAPE: S

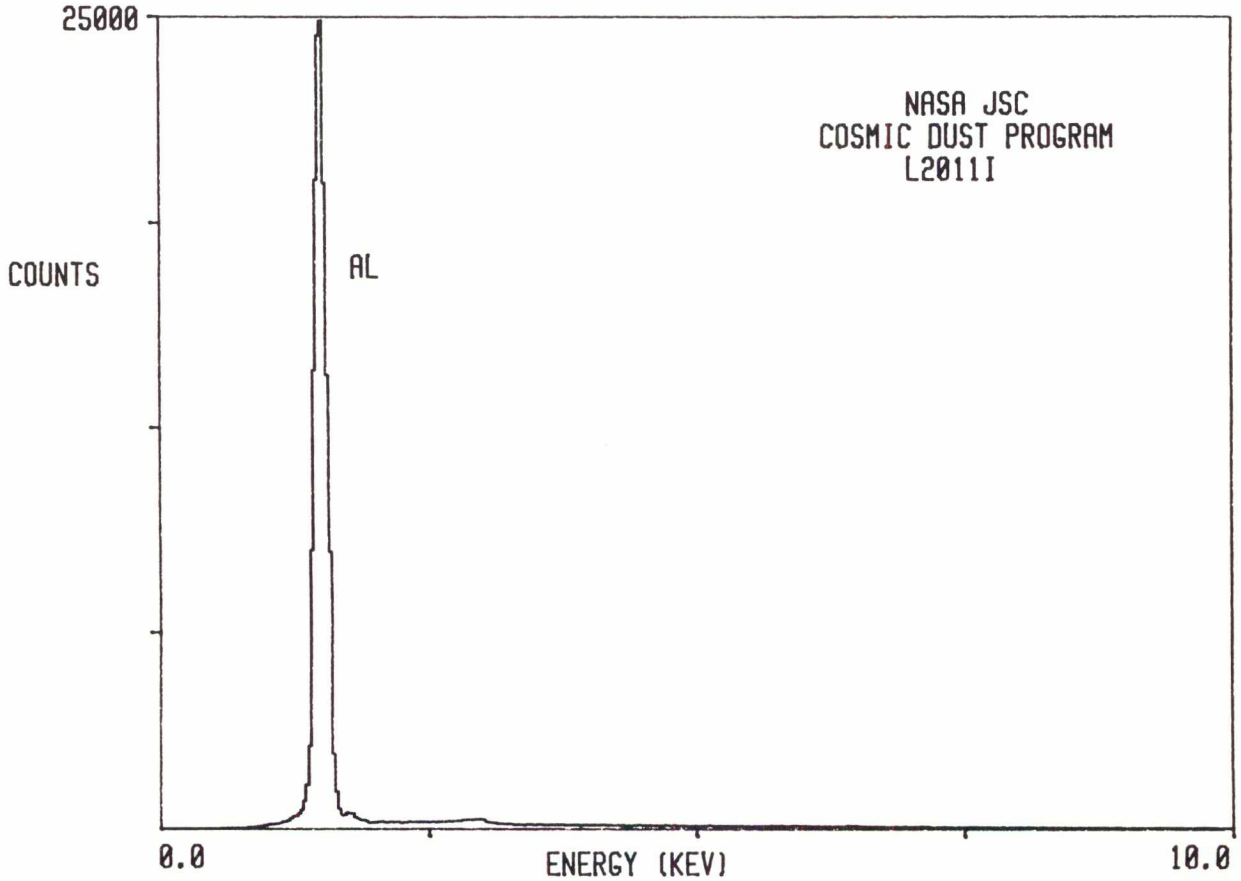
TRANS.: O

COLOR: Silver

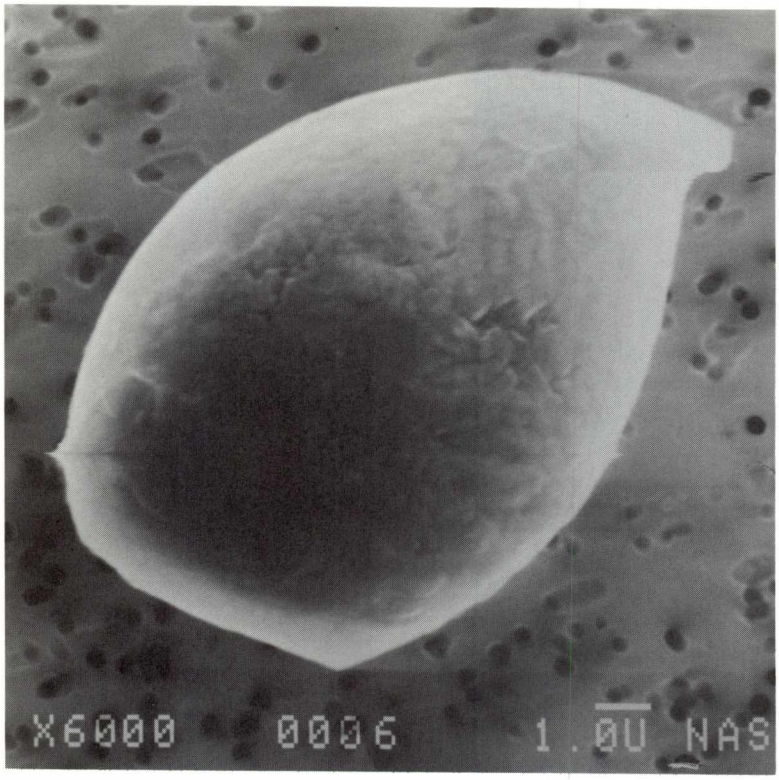
LUSTER: M

TYPE: AOS

COMMENTS:



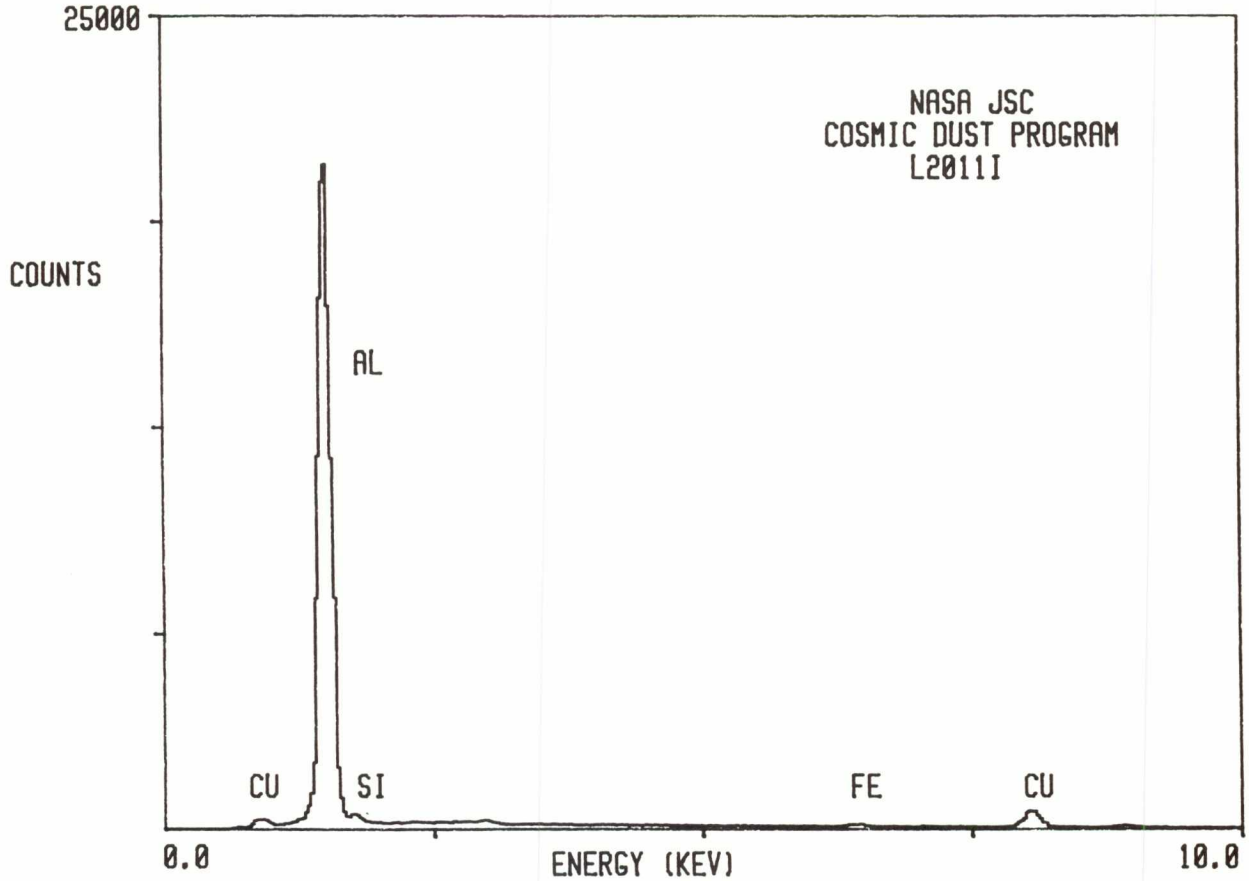
L2011 I 3



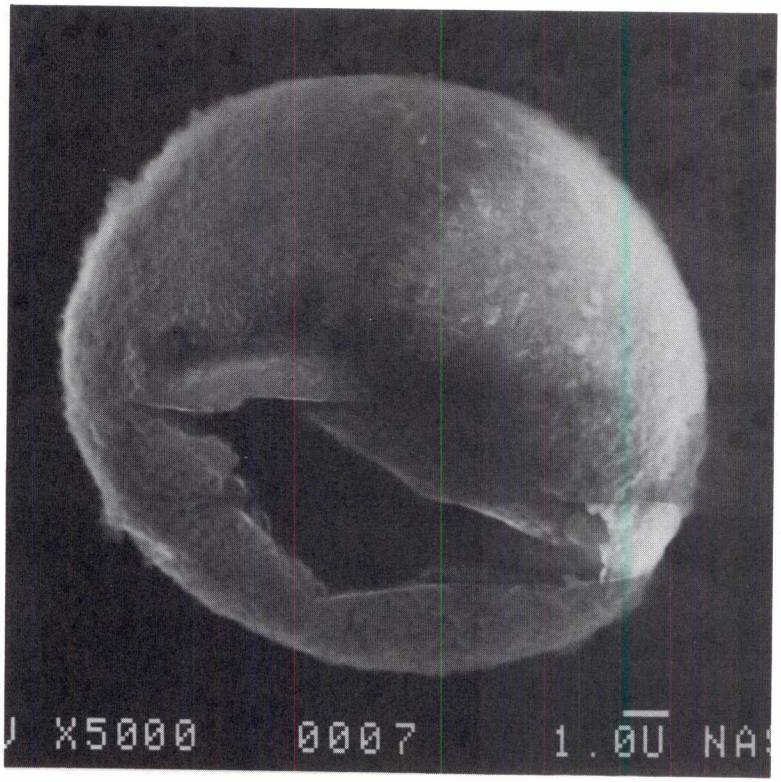
SIZE: 12
SHAPE: S
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: AOS

COMMENTS:

S-92-35817



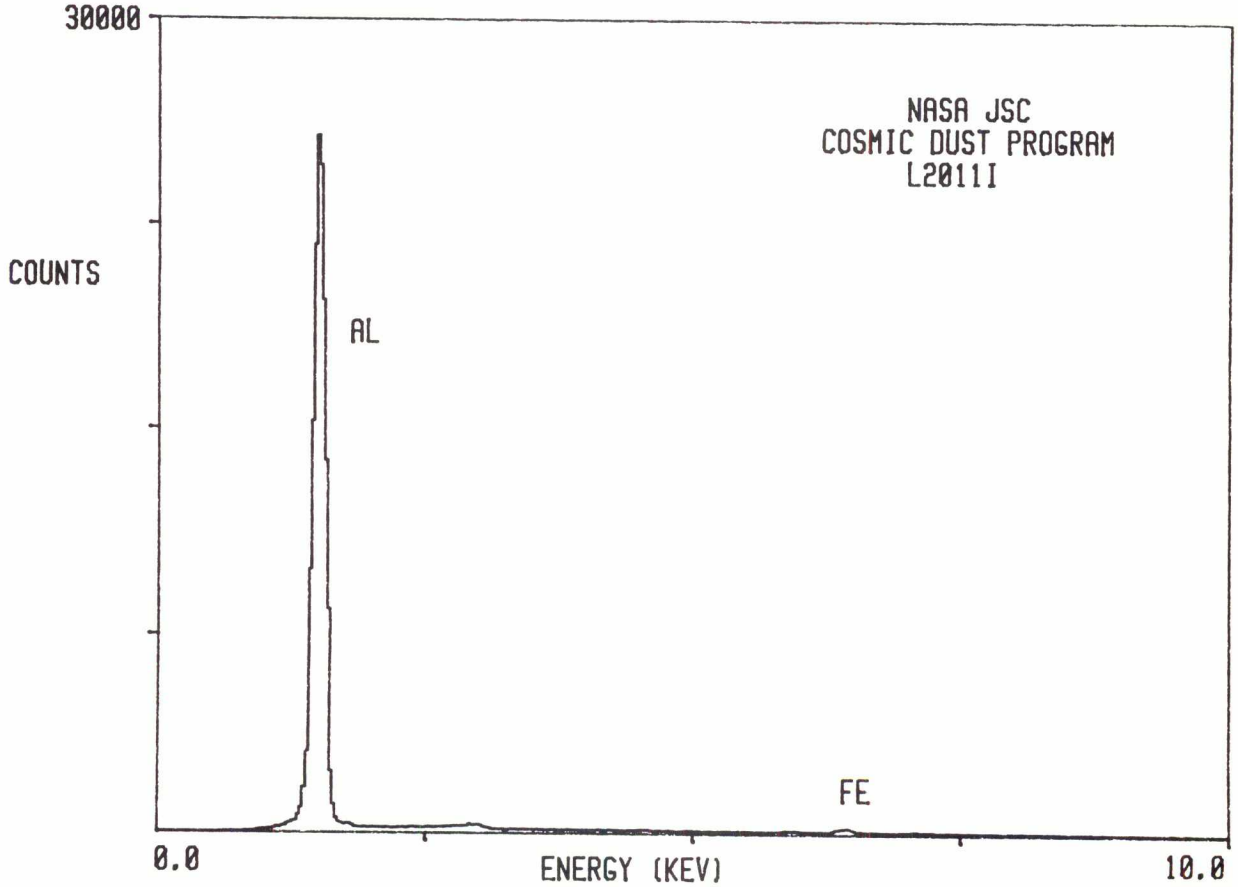
L2011 I 4



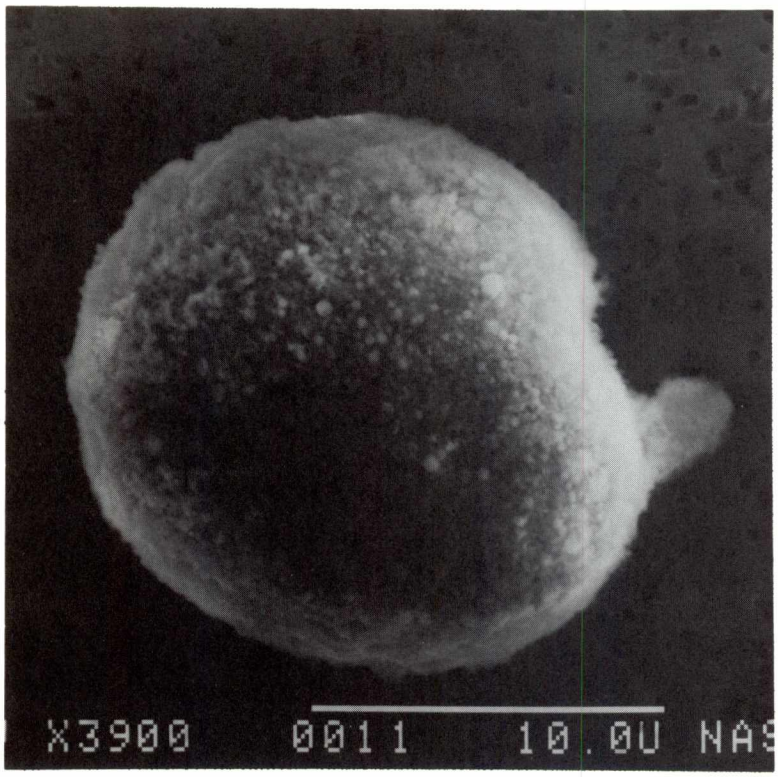
SIZE: 15
SHAPE: S
TRANS.: O
COLOR: Silver
LUSTER: M
TYPE: AOS

COMMENTS:

S-92-35818



L2011 I 5



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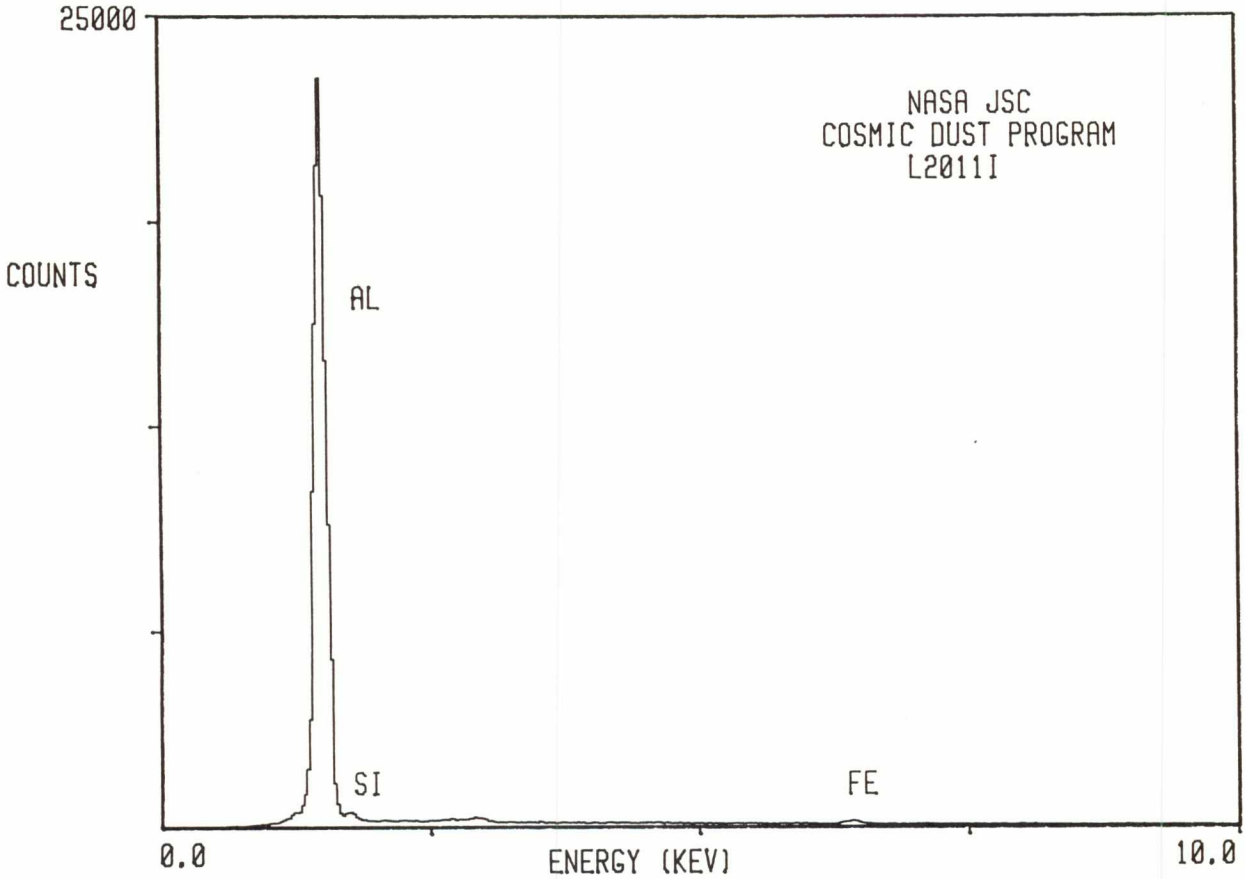
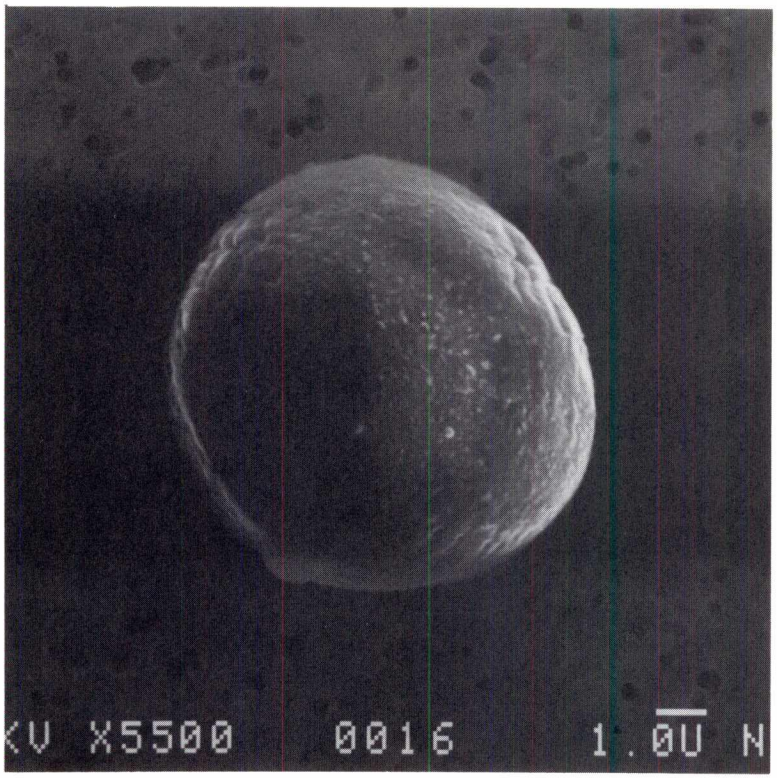
COLOR: Silver
LUSTER: M
TYPE: AOS

COMMENTS:

S-92-35819



L2011 I 6



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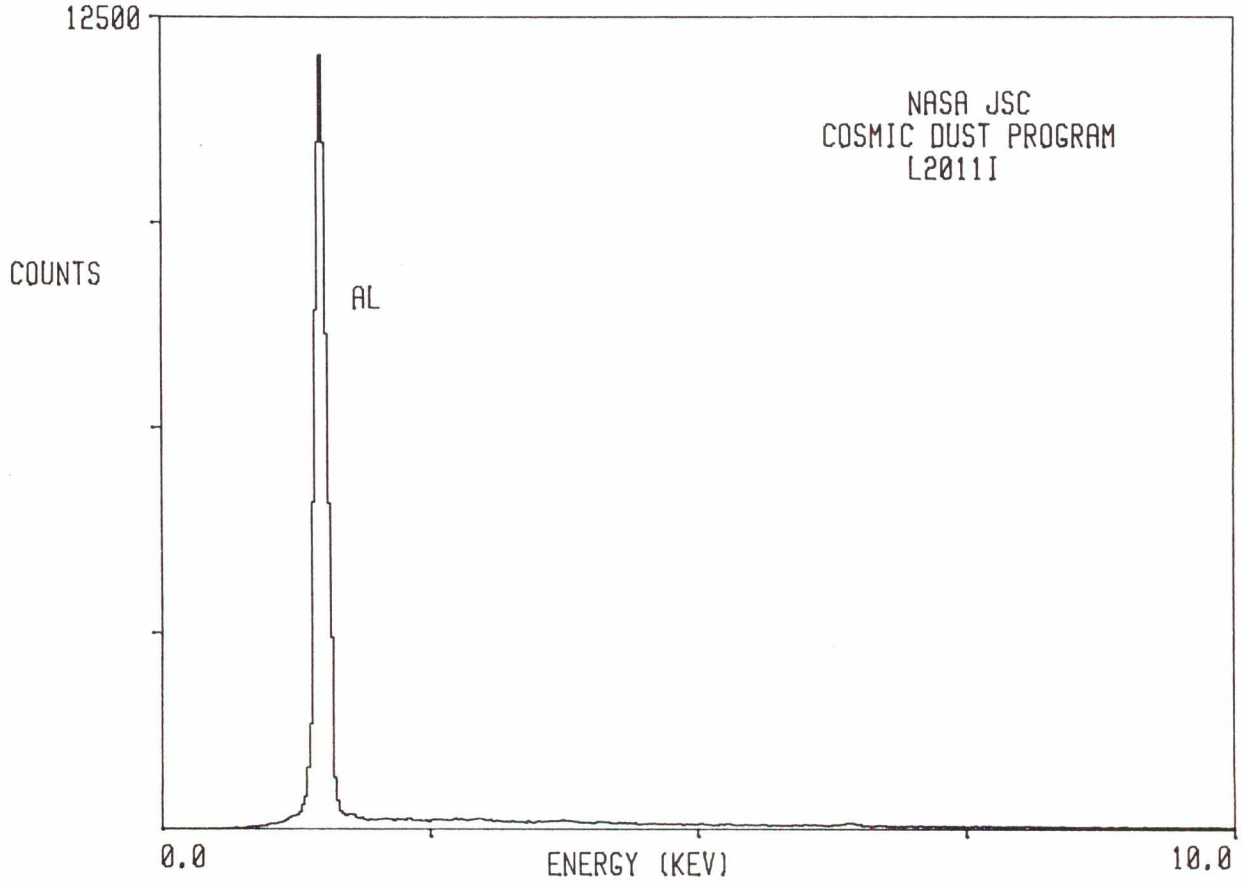
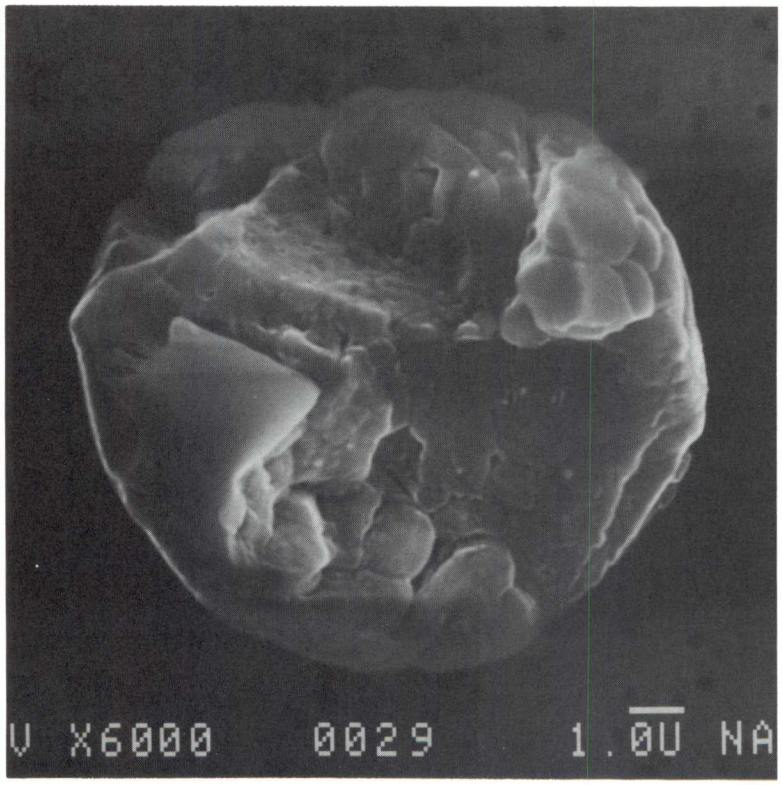
COLOR: Silver
LUSTER: M
TYPE: AOS

COMMENTS:

S-92-35820



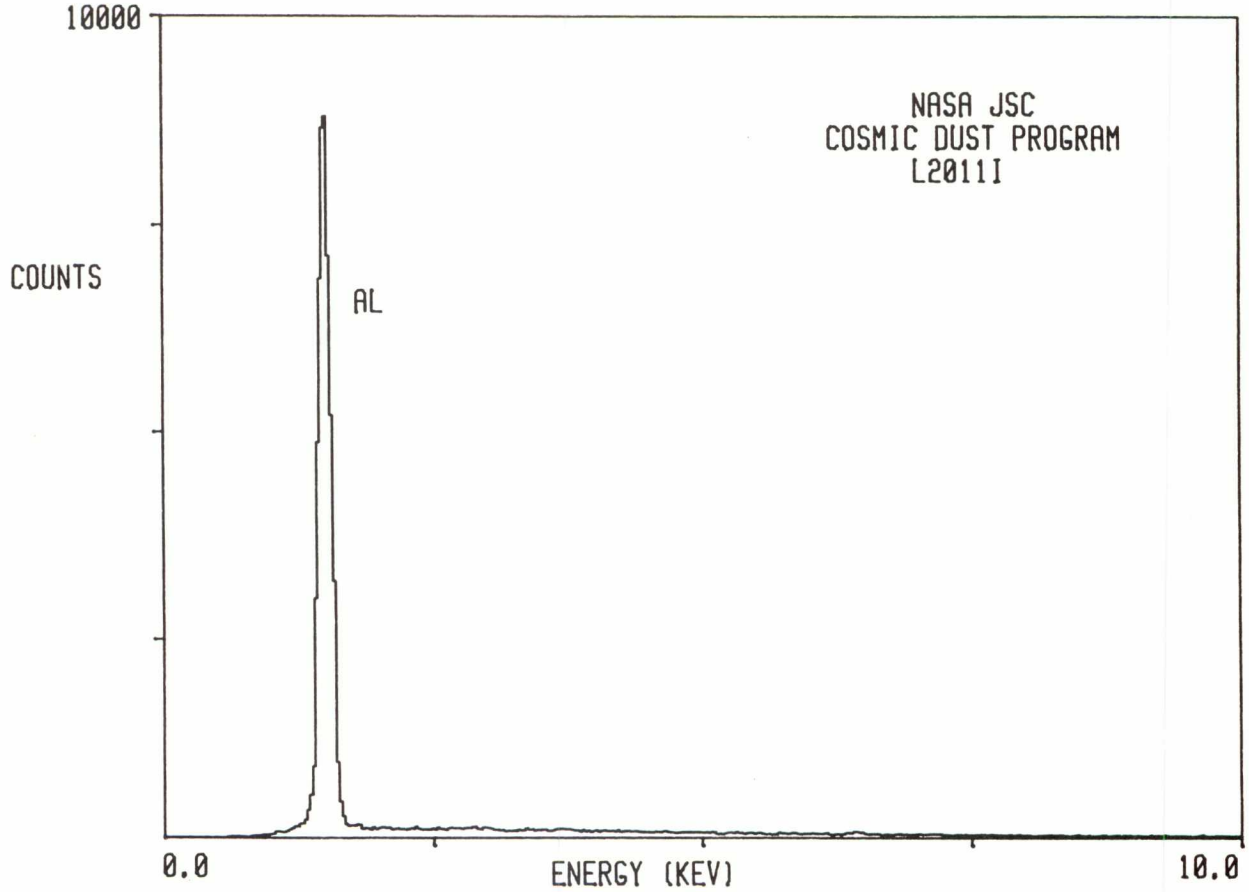
L2011 I 10



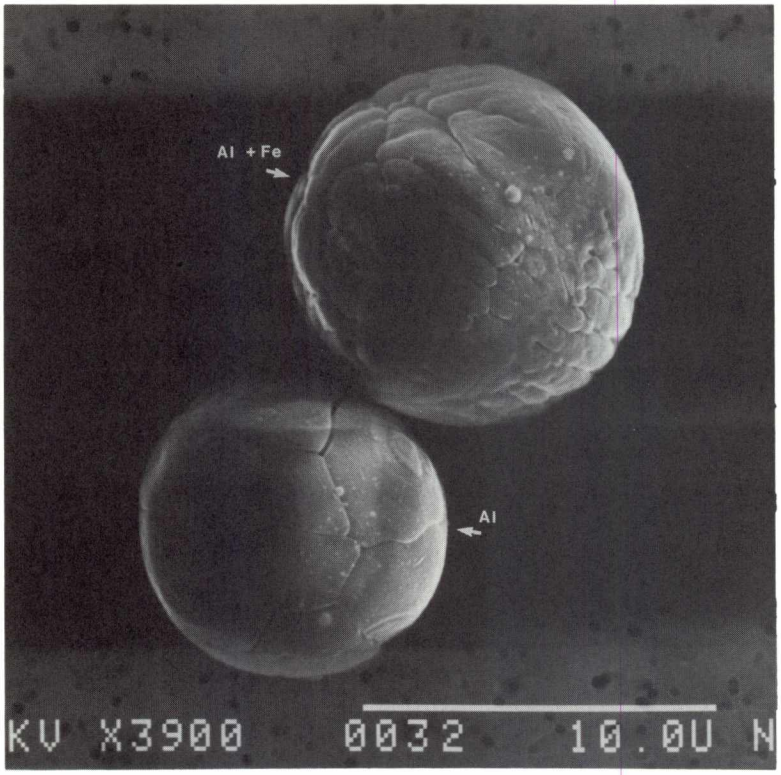
SIZE: 13
SHAPE: S
TRANS.: TL
COLOR: Colorless
LUSTER: R
TYPE: AOS

COMMENTS:

S-92-35825



L2011 I 11



S-92-35826

SIZE: 10/8

SHAPE: S

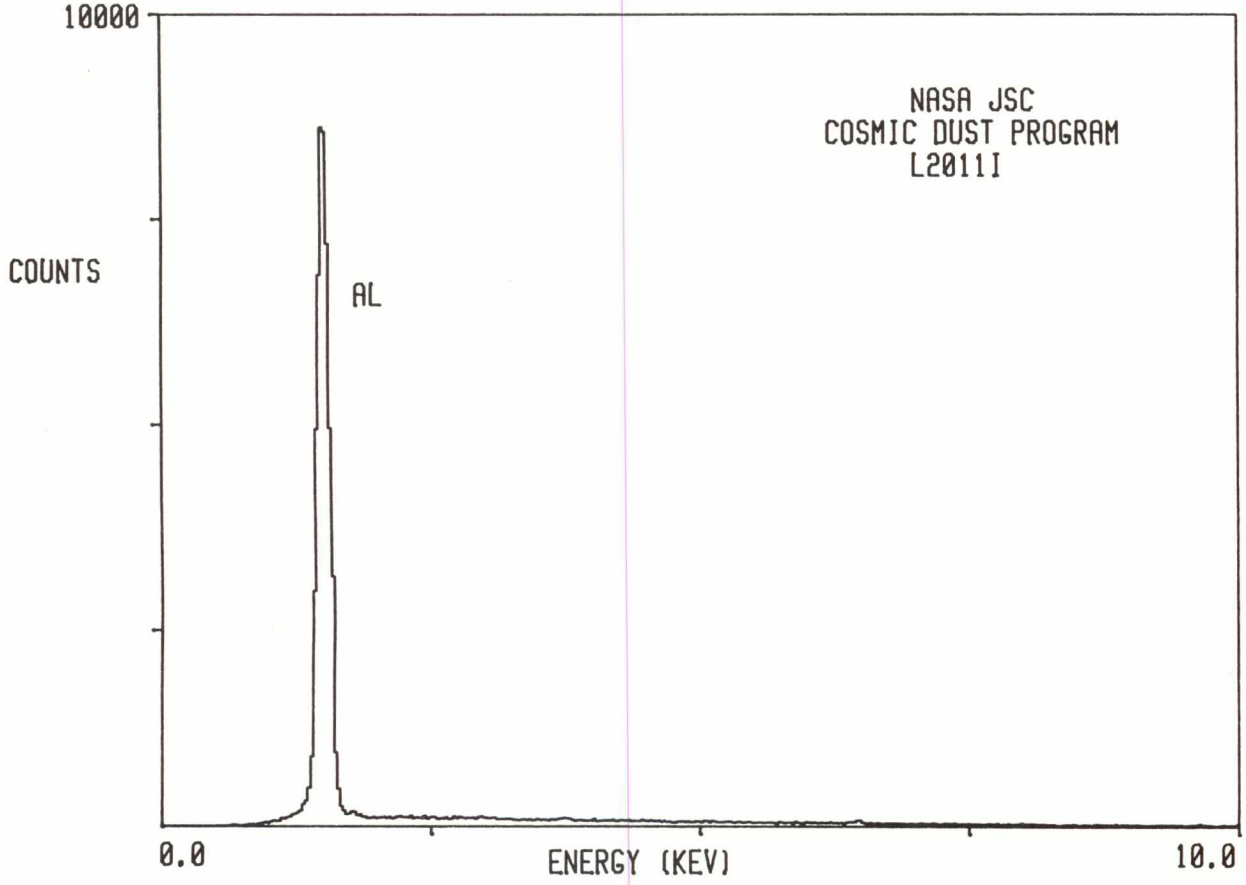
TRANS.: TL

COLOR: White

LUSTER: V

TYPE: AOS

COMMENTS:

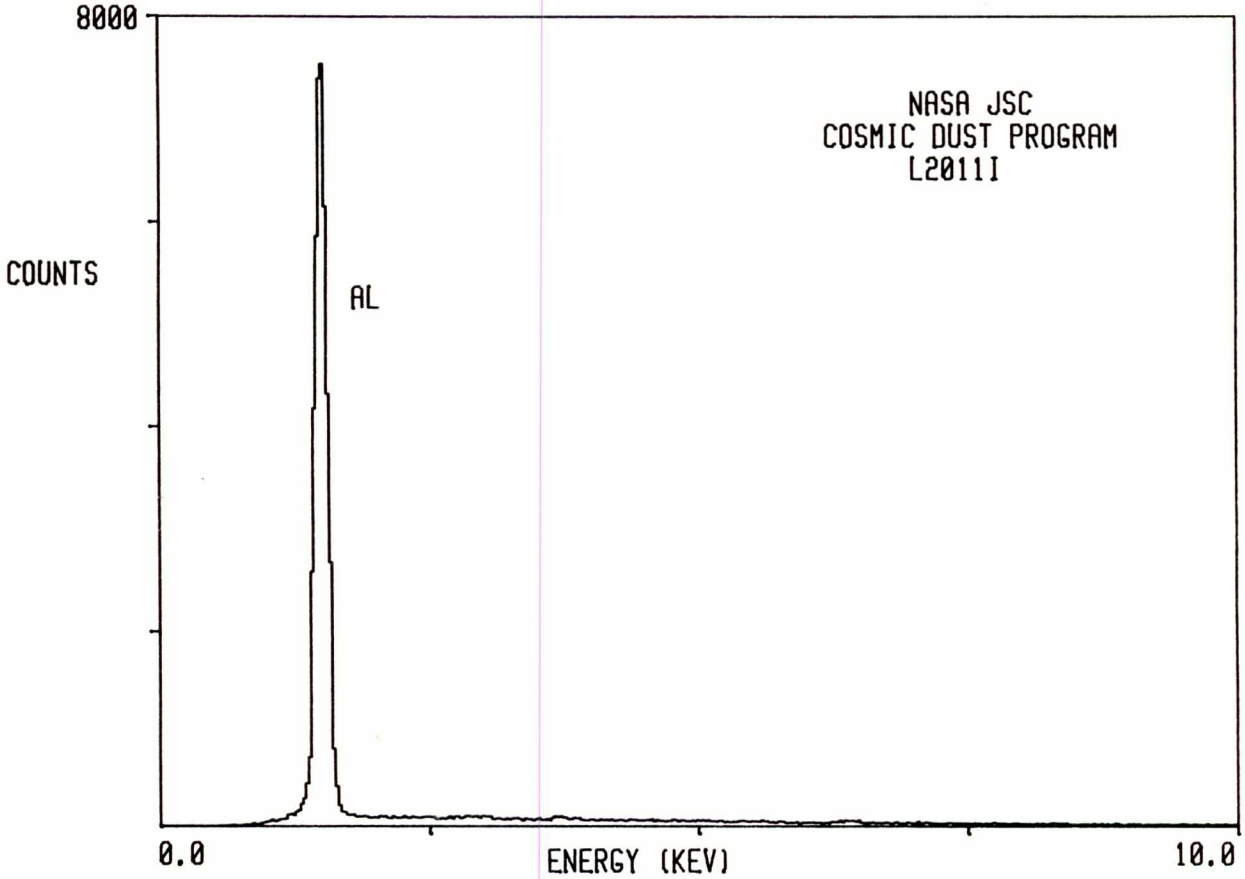


L2011 I 12

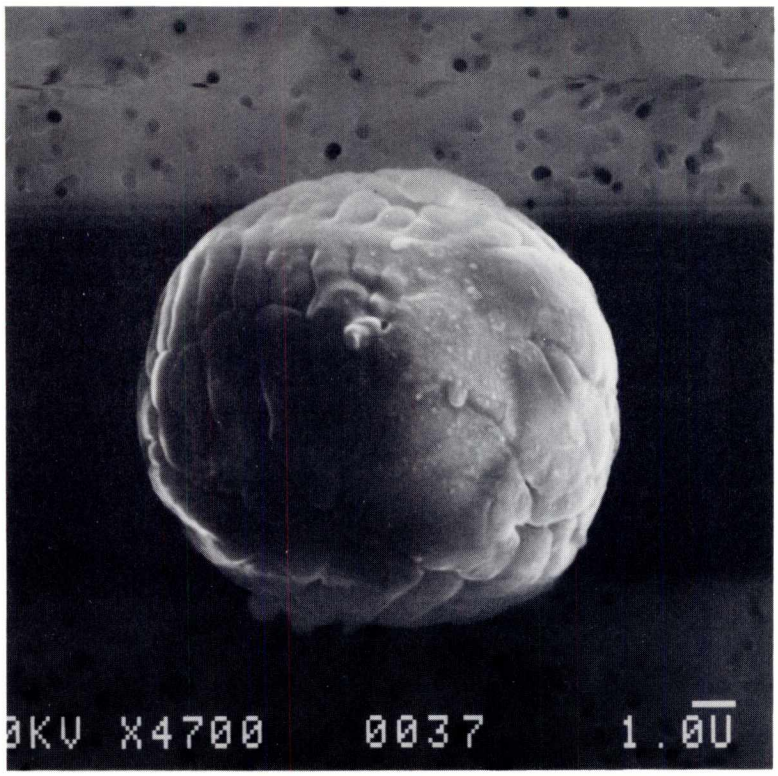
SIZE: 11
SHAPE: S
TRANS.: TL
COLOR: White
LUSTER: R
TYPE: AOS

COMMENTS:

S-92-35827



L2011 I 13



SIZE: 15

SHAPE: S

TRANS.: TL

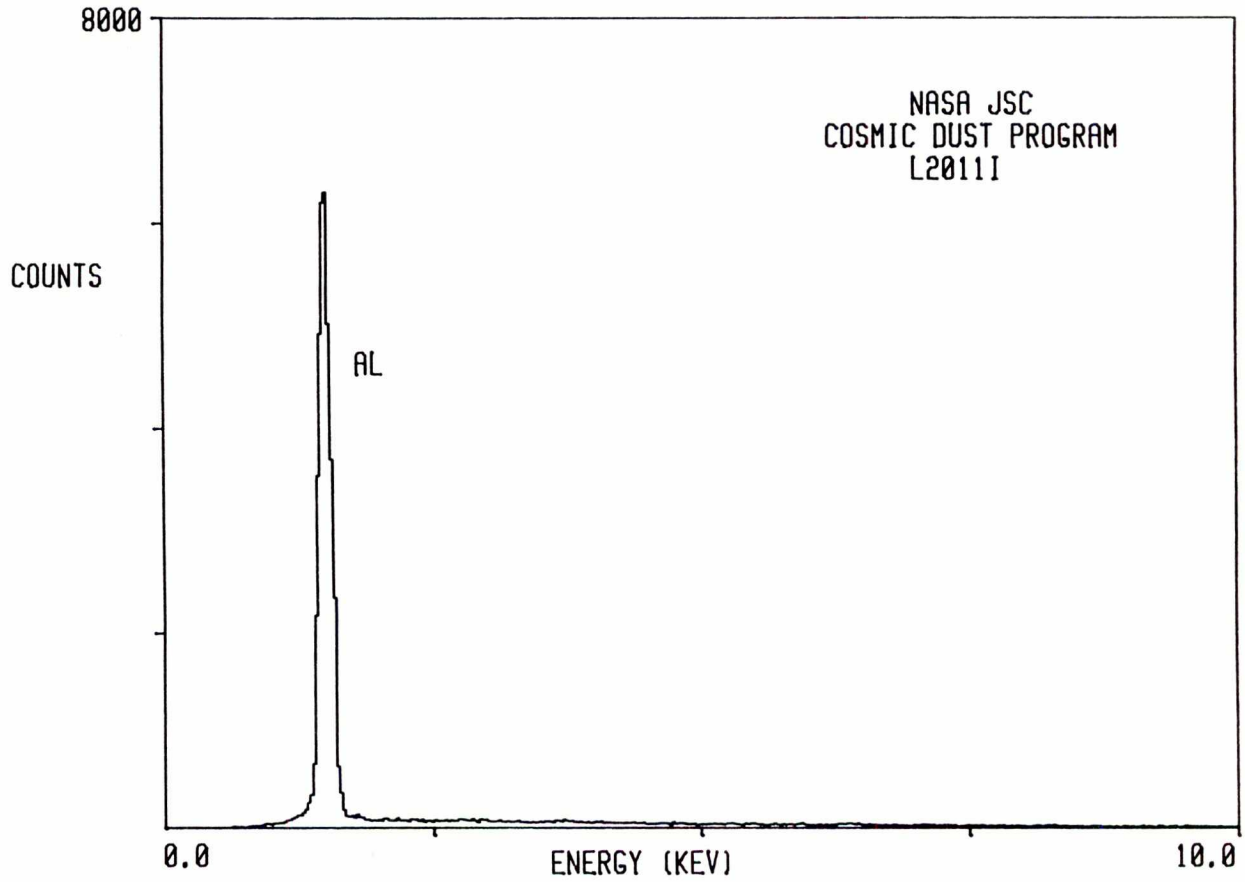
COLOR: Colorless to White

LUSTER: R

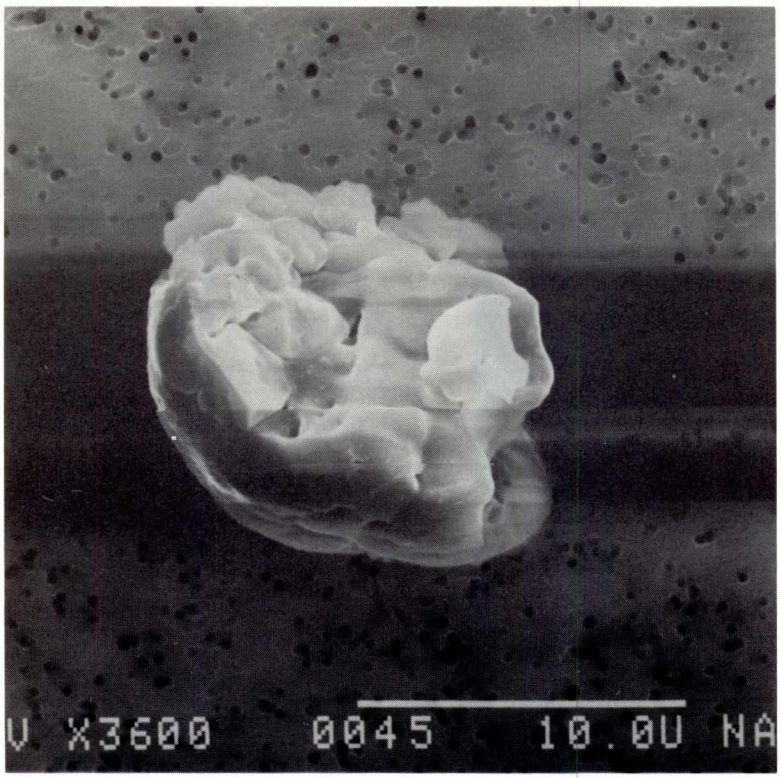
TYPE: AOS

COMMENTS:

S-92-35828



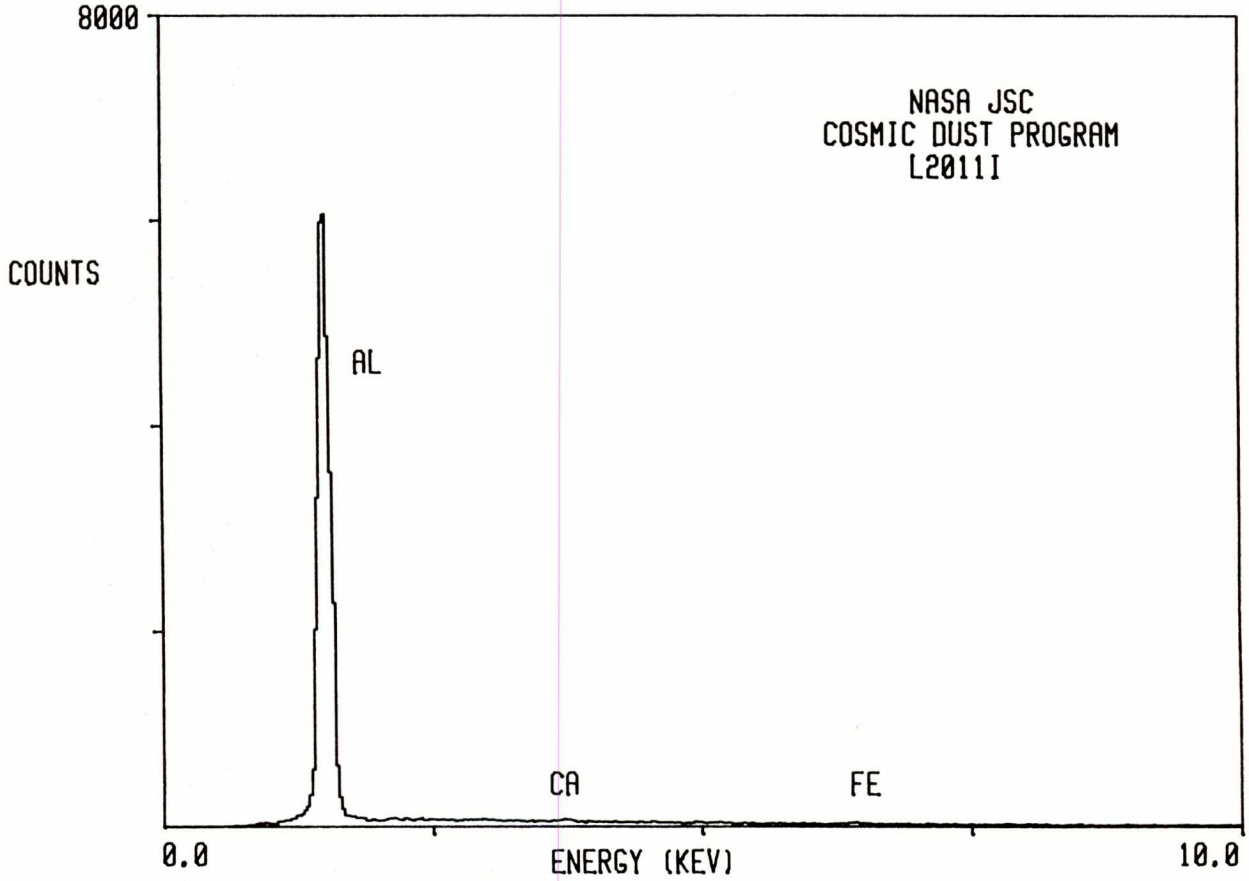
L2011 I 15

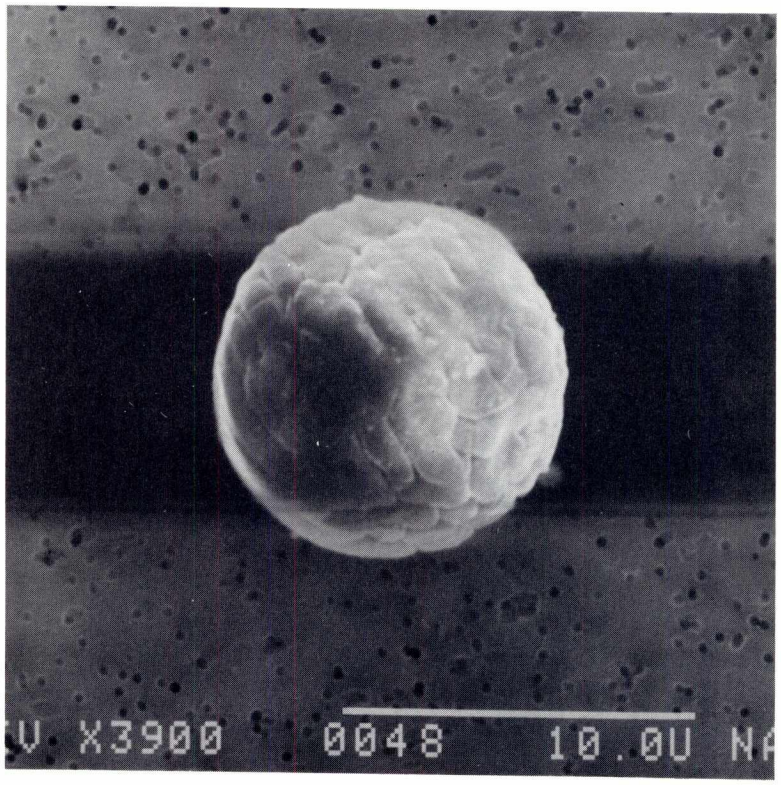


S-92-35829

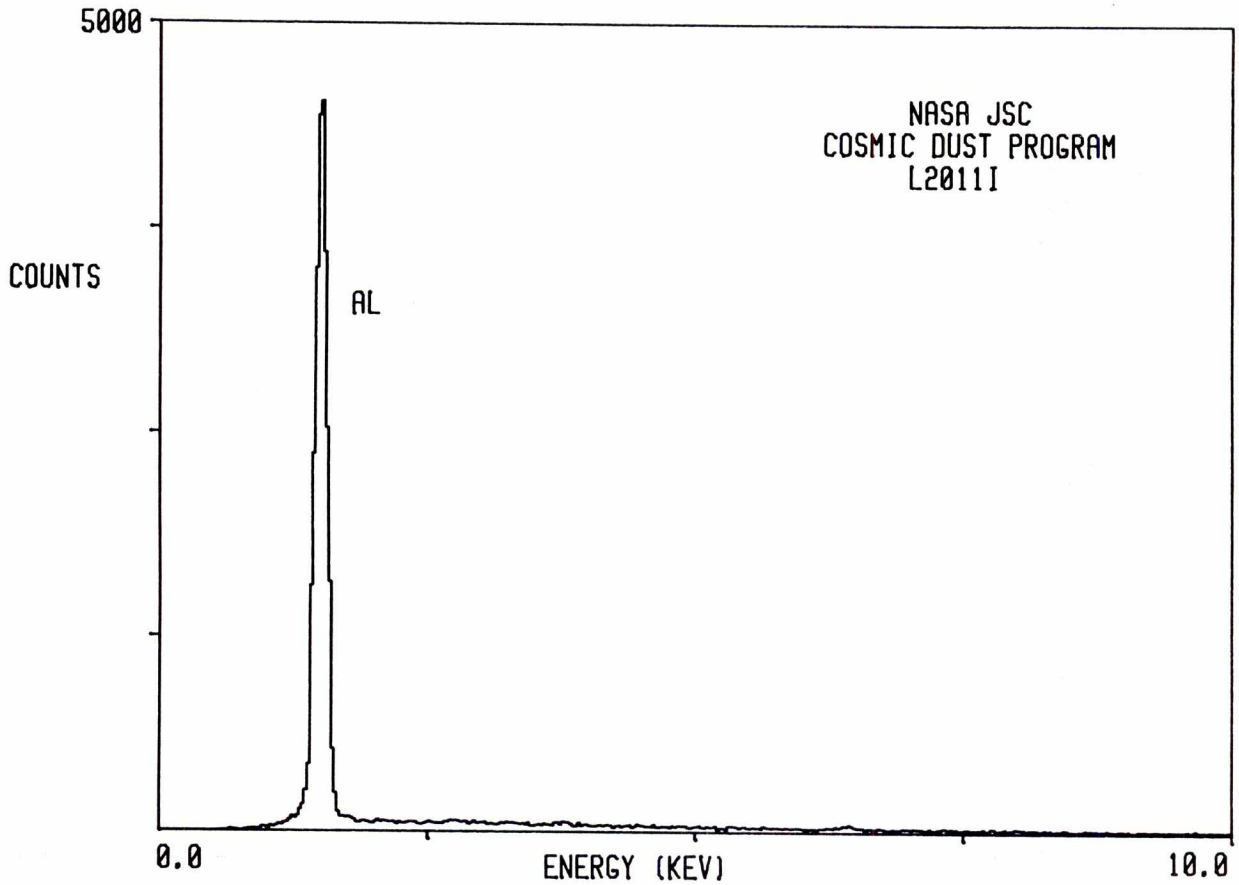
SIZE: 20
SHAPE: S
TRANS.: T/TL
COLOR: Brown
LUSTER: V
TYPE: AOS

COMMENTS:





S-92-35831

SIZE: 10
SHAPE: S
TRANS.: TL
COLOR: White
LUSTER: V
TYPE: AOS

COMMENTS: