

10018

Sample 10018 is a rounded, dark grey, fine breccia that originally weighed 213gm., and measured 8 X 5 X 4 cm. Sample was returned in ALSRC #1004.

BINOCULAR DESCRIPTION BY: Twedell DATE: 8-6-75

ROCK TYPE: Fine Breccia SAMPLE: 10018,0 WEIGHT: 215 gm

COLOR: Dark Grey (fresh & exposed) DIMENSIONS: 8 x 6 x 4 cm.
Steel Grey (sawed)

SHAPE: Rounded

COHERENCE: Intergranular – tough
Fracturing – few, non-penetrative

FABRIC/TEXTURE: Anisotropic/Fine Breccia

VARIABILITY: Homogeneous

SURFACE: Slightly irregular; patch of vesicular glass near narrow end (PET).

ZAP PITS: Few on T₁ surface only. Pits are glass lined up to 4 mm in size.

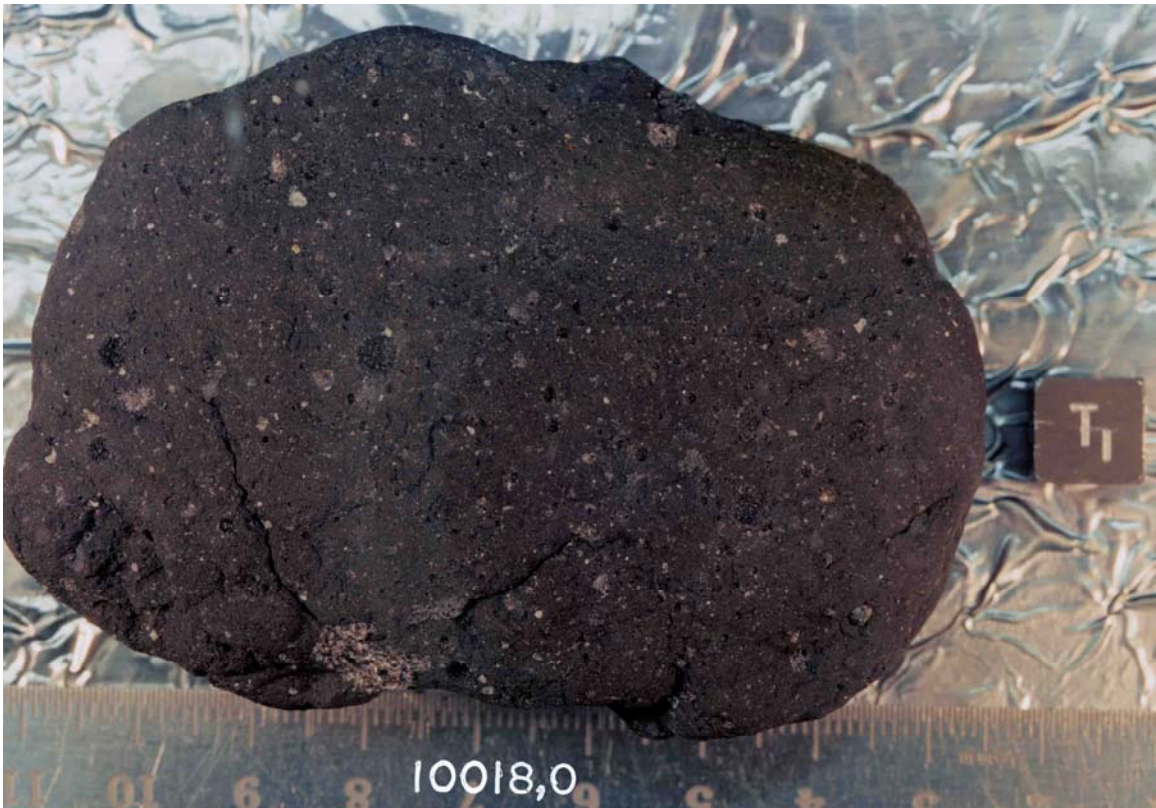
CAVITIES: None

<u>COMPONENT</u>	<u>COLOR</u>	<u>% OF ROCK</u>	<u>SHAPE</u>	<u>SIZE (MM) DOM. RANGE</u>	
Matrix	Dk.Grey	97-98	-----	<.1	--
Salt and Pepper Clast ₁	Black & White	<1	Subrounded	1-1.5	<1-2
White Clast ₂	White	<1	Subangular to subrounded	1	1-2.5
Basaltic Clast ₃	White & Hon. Brown	1-2	Angular to subangular	1-5	1-10

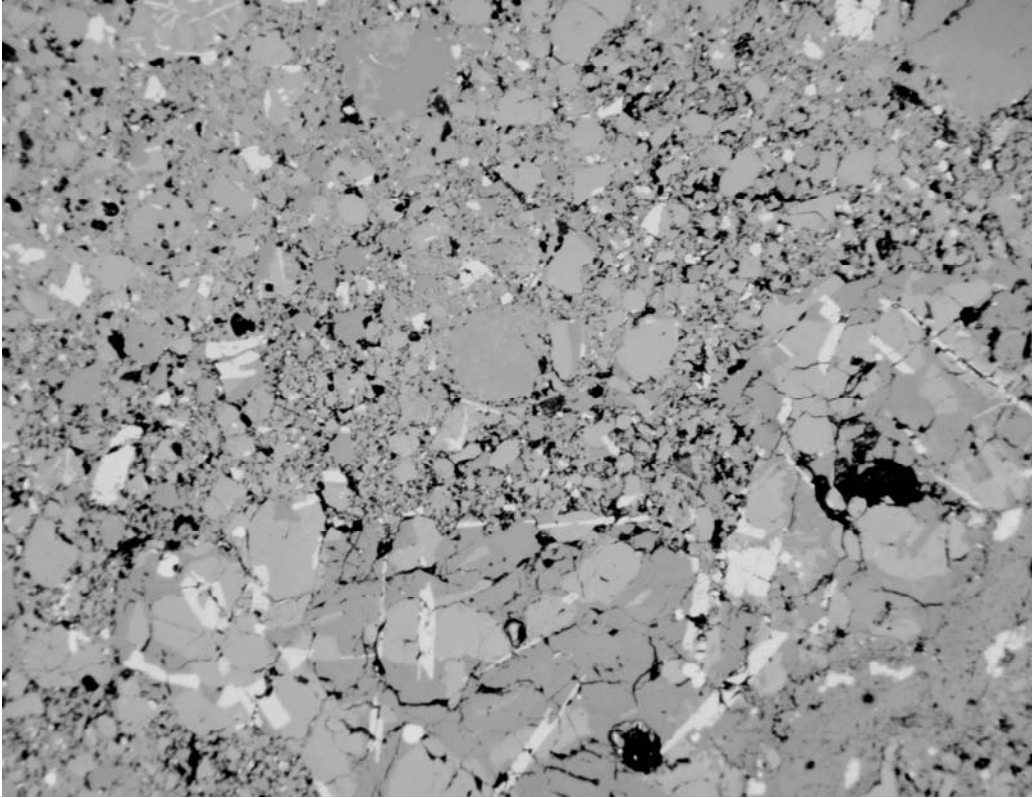
1. Salt & pepper clast is aphanitic in texture. It has an even distribution of light and dark material.
2. White clast has a powdered sugar texture. Clasts are evenly distributed throughout the rock. It appears to be approximately 90% plagioclase.
3. Basaltic clast consists of 35% plagioclase, 30% ilmenite and 35% pyroxene.



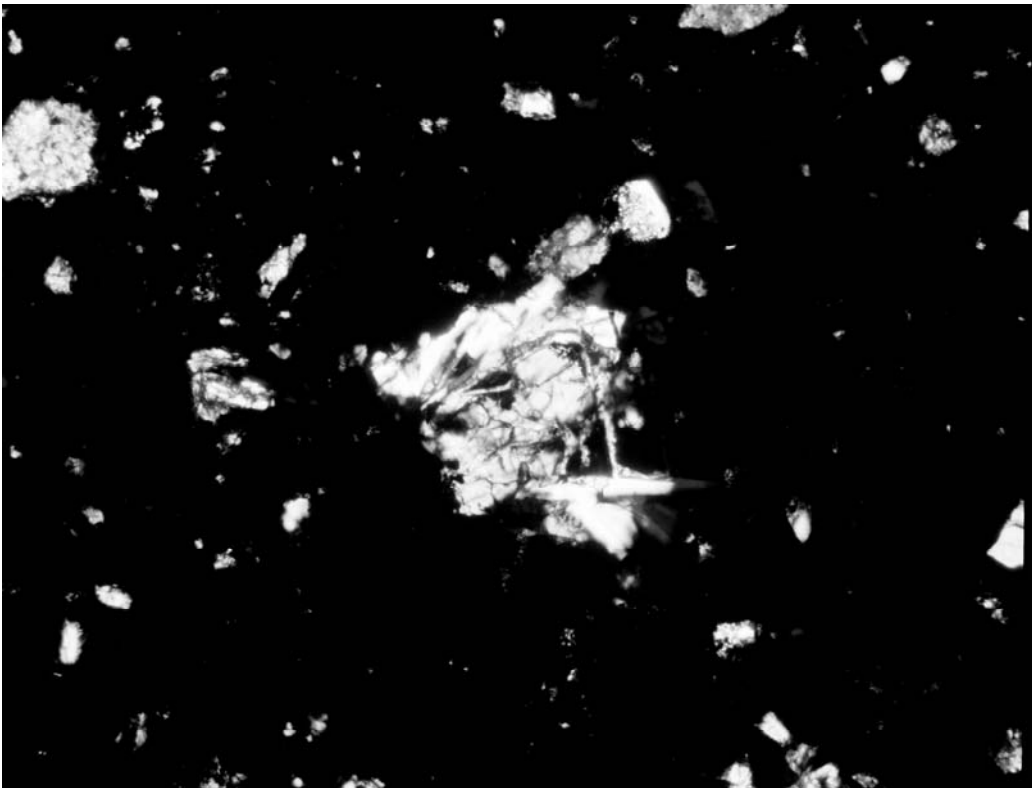
10018,1
Original PET Photo (S-69-46005)



10018,0
(S-75-30226)



S-76-26310- Section 10018,32 Width of field 1.39 mm reflected light



S-75-30943- Section 10018,32 Width of field 1.39 mm plane light

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THIN SECTION DESCRIPTION BY: Walton DATE: 6/22/76

SECTION: 10018,32

SUMMARY: Slightly devitrified typical breccia with only moderate amounts of clast present. Many of the lithic clasts are crushed and granulated. The rock appears to be a high glass breccia with minor crystalline inclusions.

Matrix 78% of Rock

<u>Phase</u>	<u>% Section</u>	<u>Shape</u>	<u>Size (mm)</u>	<u>Comments</u>
Dark Brown nearly opaque	100%	-----	< 0.001	Very high turbid glass content; some cryptocrystalline phases.

Mineral Clasts 7% Rock

<u>Phase</u>	<u>Relative Abundance</u>	<u>Shape</u>	<u>Size (mm)</u>
Clinopyroxene ₁	Very abundant	Angular	0.001-0.4
Plagioclase ₂	few	Blocky	0.001-0.2
Opagues ₃	moderate	Lath-like to Skeletal	0.001-0.2

- 1) Highly granulated to single crystals
- 2) Normal, sharp twins
- 3) Isolated, most large crystals in clasts

Lithic Clasts 13% of Rock

<u>Type</u>	<u>Relative Abundance</u>	<u>Shape</u>	<u>Size (mm)</u>
Small	Very abundant	Rounded to irregular	0.001-1.0
Large ₄	Six present	Rounded to irregular	>1.0

- 1) a. Coarse-grained basalt composed of clinopyroxene, plagioclase, and ilmenite.
b. Coarse-grained basalt with brown pyroxene crystals, somewhat granulated.
c. Coarse-grained basalt with part of the clast showing melting and subsequent devitrification.

- d. Coarse-grained basalt composed of clinopyroxene, plagioclase and ilmenite.
- e. Coarse-grained basalt composed of clinopyroxene, plagioclase, and ilmenite.
- f. Coarse-grained basalt similar to (b).

Glass Clasts 2% of Rock

<u>Type</u>	<u>Relative Abundance</u>	<u>Shape</u>	<u>Size(mm)</u>
Yellow-orange ₅	Very abundant	Spherical to irregular	0.001-0.2
Colorless ₆	Moderate	Spherical to angular	0.001-0.3
Red-orange ₇	Few	Irregular	0.05

- 2) Some devitrification; mostly angular
- 3) Bubble and some devitrification; mostly angular.
- 4) One piece.

Selected References: Chao et al. (1970), Dence et al. (1970), Reid et al. (1970).

HISTORY AND PRESENT STATUS OF SAMPLES 10/12/76

10018 was removed from ALSRC #1004 and originally processed in the Vac Lab. It was in the F-201 system at the time of the glove rupture. A small chip was transferred to PCTL for PET analyses. At some time, a small portion of the sample was sawed in SPL. Most of the original sample is intact and was re-examined in SSPL.

PRISTINE SAMPLES:

0	199.40 gm	Rock. It has pits and patina on one large face. All other faces are non-exposed. VAC-SSPL
2	1.87 gm	Chips. It consists of one large chip (1.5gm) with no sawed or exposed surfaces, some <5mm chips and some fines. VAC-PCTL-SSPL
16	3.17 gm	<1mm fines. VAC-SPL-SSPL
17	3.70 gm	Three large sawed chips and two unsawed chips. None of the pieces show evidence of pitting or patination. Samples was probably removed

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from lunar bottom of the mother rock. VAC-SPL-SSPL

RETURNED SAMPLES:

24 25.25 gm Fresh chip. One small (1.5mm) pyroxene clast not
previously noted.

CHEMICAL ANALYSES

Element	Number of Analyses	Mean	Units	Range
SiO ₂	4	42.46	PCT	1.29
Al ₂ O ₃	4	12.48	PCT	2.07
TiO ₂	4	8.25	PCT	1.50
FeO	4	16.4	PCT	3.21
MnO	5	.194	PCT	0.084
MgO	3	8.18	PCT	.665
CaO	3	11.97	PCT	.70
Na ₂ O	4	.492	PCT	0.068
K ₂ O	4	.170	PCT	0.020
P ₂ O ₅	1	.15	PCT	0
Li	2	12.65	PPM	1.3
Rb	3	3.68	PPM	.19
Be	1	1.8	PPM	0
Sr	4	158.78	PPM	85
Ba	4	218.75	PPM	105.0
Sc	4	63.52	PPM	10.2
V	3	59.33	PPM	16.0
Cr ₂ O ₃	5	.291	PCT	.067
Co	5	32.88	PPM	4.10
Ni	3	255.67	PPM	173.0
Cu	2	22.0	PPM	20.00

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Element	Number of Analyses	Mean	Units	Range
Zn	2	38.5	PPM	31.0
Y	2	101.5	PPM	9.0
Zr	4	356.75	PPM	101.0
Nb	2	22	PPM	6.0
Ta	3	1.53	PPM	.3
Hf	3	12.43	PPM	2.4
Au	1	5.00	PPB	0
La	5	18.16	PPM	9.0
Ce	5	61.56	PPM	19.2
Nd	3	44.8	PPM	31.0
Sm	4	14.4	PPM	3.1
Eu	4	1.80	PPM	0.19
Pr	1	11.0	PPM	0
Gd	1	20.5	PPM	0
Tb	3	3.44	PPM	1.48
Dy	2	20.4	PPM	2.8
Ho	2	5.05	PPM	.5
Er	1	12.8	PPM	0
Yb	4	12.38	PPM	4.1
Lu	4	1.74	PPM	0.74
Th	3	2.81	PPM	1.42
U	4	0.585	PPM	0.08
Ga	2	4.2	PPM	0.4
In	1	0.36	PPM	0
O	2	40.4	PCT	0.6
S	1	0.15	PCT	0
F	1	101.0	PPM	0
Cl	1	16.5	PPM	0

Analysts: Compston et al., (1970); Ehmann & Morgan, (1970); Goles et al., (1970); Wanke et al., (1970); O'Hara et al., (1974); Ansell & Helz, (1970); Philpotts & Schnetzler, (1970); O'Kelly et al., (1970); Wanke et al., (1972).

NO AGE REFERENCES