

10061

Sample 10061 is a sub-angular, medium grey, fine breccia. This sample originally weighed 346gm and measured 9x8.5x8.7cm. It was returned in ALSRC #1004 (Documented Sample container).

BINOCULAR DESCRIPTION BY: Kramer DATE: 6/24/76

ROCKTYPE: Fine Breccia SAMPLE: 10061,18 WEIGHT: 82 gm

COLOR: Medium grey DIMENSIONS:5.8 x 3.5 x 2 cm

SHAPE: Sub-angular

COHERENCE: Intergranular - friable (granulated)
Fracturing - absent

FABRIC/TEXTURE: Anisotropic/Fine Breccia

VARIABILITY: Homogeneous

SURFACE: Granulated

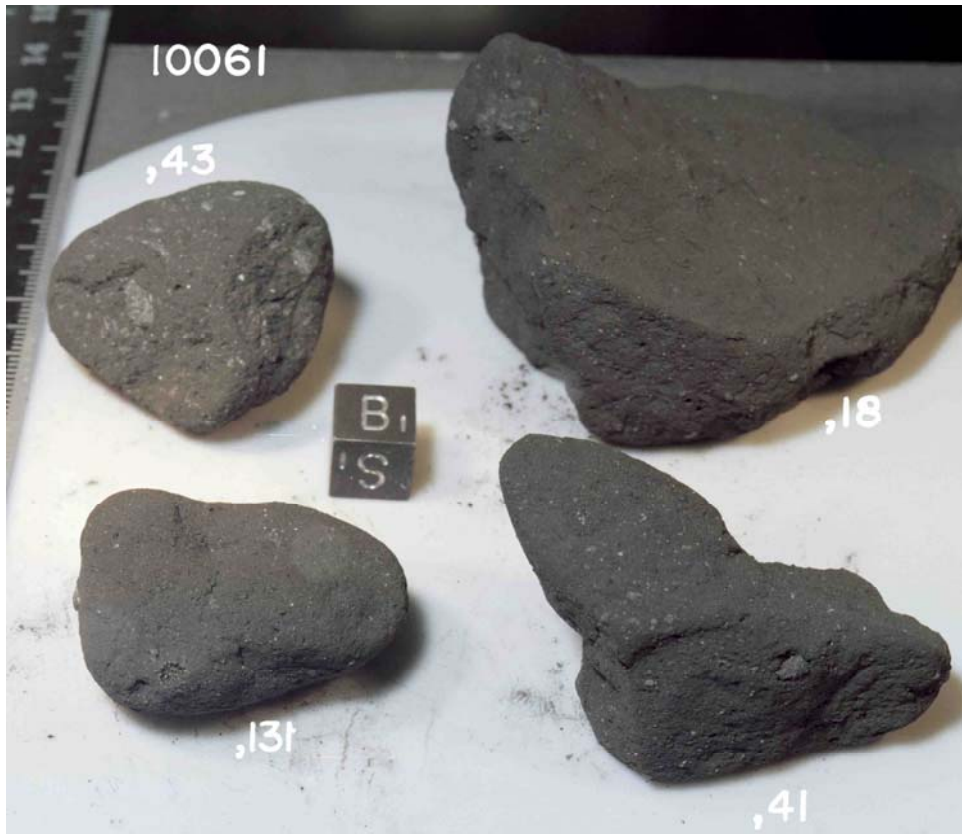
ZAP PITS: Few – T₁

CAVITIES: Absent

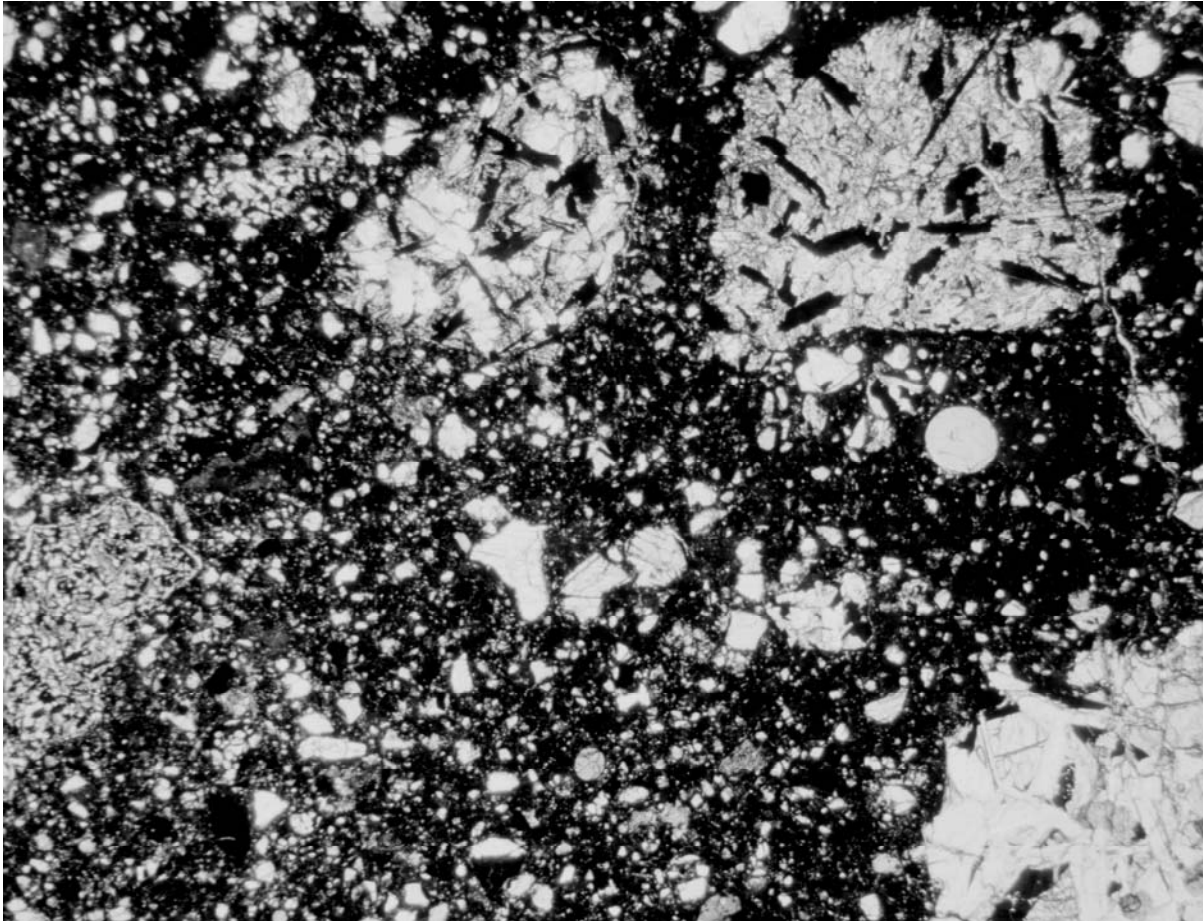
<u>COMPONENT</u>	<u>COLOR</u>	<u>% OF ROCK</u>	<u>SHAPE</u>	<u>SIZE(MM)</u>	
				<u>DOM.</u>	<u>RANGE</u>
Matrix	Med.Grey	90	-----	-----	-----
Salt & Pepper Clast	Blk/Wh	<1	Angular	1.5	0.05-2.0
Basalt Clast	Med.Grey	2	Sub-angular	2.	0.05-3.0
Grey & White Clast	Grey/Wh	3	Sub-rounded	0.5	0.01-7.0
White Clast	White	5	Angular	0.5	0.01-1



10061,0 Original PET Photo (S-69-46506)



10061,18,41,43,131 S-75-34230



S-76-26313

SECTION: 10061,28

Width of field 2.72mm plane light

THIN SECTION DESCRIPTION

BY: Walton

DATE: 6/24/76

SUMMARY: Partly devitrified breccia with a pronounced change in the matrix from one part of the section to another. Approximately one half of the section has a nearly colorless to pale brown glass-rich phase, while the other half has the more usual dark brown nearly opaque phase.

MATRIX 60% OF ROCK

<u>PHASE</u>	<u>% SECTION</u>	<u>SHAPE</u>	<u>SIZE (MM)</u>	<u>COMMENTS:</u>
Colorless to pale brown	50	-----	<0.001	High glass content plus numerous small crystallites; translucent to transparent.
Dark brown	50	-----	<0.001	High glass content; typical breccia matrix.

MINERAL CLASTS 14% OF ROCK

<u>PHASE</u>	<u>RELATIVE ABUNDANCE</u>	<u>SHAPE</u>	<u>SIZE(MM)</u>
Pyroxene ₁	Very abundant	Angular to irregular	0.001-0.4
Plagioclase ₂	Few	Blocky to irregular	0.001-0.2
Opaques ₃	Few	Skeletal to irregular	0.001-0.4

- 1) Mostly angular shards; poor optical characteristics.
- 2) Blocky with some twins still observable.
- 3) Most 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	Four present	Rounded to irregular	>1.0

- 4) a. Coarse-grained basalt consisting of pyroxene, plagioclase and ilmenite.
 - b. Random array of plagioclase crystals hosting small anhedral pyroxene/olivine crystals.
 - c. Fine-grained basalt consisting of pyroxene, plagioclase and ilmenite.
 - d. Fine-grained basalt consisting of pyroxene, plagioclase and ilmenite.

GLASS CLASTS 6% OF ROCK

<u>TYPE</u>	<u>RELATIVE ABUNDANCE</u>	<u>SHAPE</u>	<u>SIZE (MM)</u>
Yellow-Orange ₅	Very abundant	Angular to spherical	0.001-0.5
Brown-Yellow ₆	One present	Spherical	0.5
Colorless ₇	Few	Angular	0.001-0.4

- 5) Mostly angular shards, some part spheres.
- 6) Two immiscible glasses in a single droplet.
- 7) All shards, some with bubbles.

Selected References: Keil et al. (1970)

HISTORY AND PRESENT STATUS OF SAMPLES - 6/24/76

10061 was removed from the Documented Sample container (ALSRC #1004) and split in the Vac Lab. Some loose chips were sent to PCTL for PET analysis. Sample was split and allocated in SPL. Remaining pristine samples were re-examined in SSPL.

PRISTINE SAMPLES:

2	6.08 gm	Chips and fines. Largest chip is less than 1gm. VAC-PCTL-SSPL
18	81.76 gm	Large piece, Pitting on T ₁ . VAC-SPL-SSPL
41	30.18 gm	Large angular piece. No pitting observed. VAC-SPL-SSP_RCL-SSPL
43	23.71 gm	Large piece with some pitting on N ₁ . VAC-SPL-SSPL
44	17.62 gm	Large piece with some pitting on T ₁ . VAC-SPL-SSPL
48	12.73 gm	Chips and fines. No chips are larger than 0.25gm. VAC-SPL-SSPL
128	13.54 gm	Large chip. No pits. VAC-SPL-SSPL
129	8.69 gm	Chips and fines. Largest chips are less than 0.5gm. VAC-SPL-SSPL
130	14.11 gm	Three chips, All have some exterior surface, but no pits were observed. VAC-SPL-SSPL
131	20.13 gm	Surface piece. B ₁ is pitted. VAC-SPL-SSPL
132	5.72 gm	Three interior chips. Largest is 3.58gm. VAC-SPL-SSPL

RETURNED SAMPLES:

42	11.20 gm	Chip. No pits observed.
50	4.89 gm	Chip. No pits observed.
76	5.32 gm	Chip. No pits observed.

CHEMICAL ANALYSES

<u>Element</u>	<u>Number of Analyses</u>	<u>Mean</u>	<u>Units</u>	<u>Range</u>
SiO ₂	2	41.15	PCT	1.44
Al ₂ O ₃	4	13.10	PCT	1.17
TiO ₂	3	8.17	PCT	2.00
FeO	2	16.35	PCT	.2
MnO	3	.214	PCT	.048
MgO	2	8.8	PCT	1.95
CaO	2	11.30	PCT	1.33
Na ₂ O	3	.487	PCT	.042
K ₂ O	1	.18	PCT	0

Element	Number of Analyses	Mean	Units	Range
P ₂ O ₅	1	.14	PCT	0
H	2	1.95	CC/G	1.1
Li	2	7.5	PPM	7.0
Rb	3	3.70	PPM	.59
Cs	1	.146	PPM	0
Be	1	2.40	PPM	0
Sr	2	148.05	PPM	36.1
Ba	3	219.33	PPM	142.0
Sc	2	63.3	PPM	7.4
V	3	58.0	PPM	46.0
Cr ₂ O ₃	3	.322	PCT	.117
Co	4	31.48	PPM	12.0
Ni	2	205.5	PPM	71.0
Cu	3	21.0	PPM	9.0
Zn	3	31.07	PPM	10.0
Y	2	105.5	PPM	5.0
Zr	3	325.0	PPM	153.0
Nb	3	28.33	PPM	26.0
Pd	1	7.00	PPB	0
Ag	1	.163	PPM	0
Cd	1	.106	PPM	0
Hf	1	13.10	PPM	0
Ir	1	9.18	PPB	0
Au	1	3.42	PPB	0
Hg	1	120.	PPB	0
La	3	19.27	PPM	6.20
Ce	2	42.6	PPM	11.6
Pr	1	15.00	PPM	0
Nd	1	20.	PPM	0
Sm	1	13.2	PPM	0
Eu	1	1.78	PPM	0
Tb	1	3.40	PPM	0
Ho	1	3.7	PPM	0
Yb	1	13.1	PPM	0
Lu	1	1.94	PPM	0
Th	3	2.60	PPM	0
U	3	.638	PPM	0
Ga	3	5.33	PPM	0
Ln	1	1.43	PPM	0
Tl	1	2.70	PPB	0
C	2	221.5	PPM	81.0
Pb	1	1.74	PPM	0
Bi	1	2.79	PPB	0
O	1	41.70	PCT	0

Element	Number of Analyses	Mean	Units	Range
S	1	.150	PCT	0
Te	1	.073	PPM	0
F	1	342.0	PPM	0
Cl	1	7.54	PPM	0
Br	2	.253	PPM	.014

Analysts: Compston et al., (1970); Ehmann & Morgan, (1970); Ganapathy et al., (1970); Goles et al., (1970); Annell & Helz, (1970); D'amico et al., (1970); Reed & Jovanovic, (1970); Morrison et al., (1970); Herzog & Herman, (1970); Tatsumoto, (1970); Epstein & Taylor, (1970); Epstein & Taylor, (1971).

Age References: Tatsumoto (1970).