

10068

Sample 10068 is a subangular to subrounded, medium dark grey, microbreccia. This sample originally weighed 218 gm and measured 14 x 5 x 4 cm. The sample was originally returned in ALSRC Container #1004.

BINOCULAR DESCRIPTION

BY: Twedell

DATE: 2-17-76

ROCK TYPE: Microbreccia

SAMPLE: 10068,5

WEIGHT: 96.7 gm

COLOR: Medium Dark Grey

DIMENSIONS: 5.3 x 4 x 2.2 cm

SHAPE: Subangular-Subrounded

COHERENCE: Intergranular - coherent

Fracturing - Absent; Micro-fracturing present parallel to surface. (PET)

VARIABILITY: Homogeneous

SURFACE: Smooth on pitted surfaces, slightly irregular on fresh surfaces. Overall blocky appearance. Glassy spatter in places.

ZAP PITS: Many on E₁, N₁, and B₁. None on others. Pits are glass lined, approximately 0.3mm in diameter.

CAVITIES: Absent

<u>COMPONENT</u>	<u>COLOR</u>	<u>%OF ROCK</u>	<u>SHAPE</u>	<u>SIZE(MM) DOM. RANGE</u>	
Matrix	Med.Dk.Grey	97			
GreenClast ₁	Green	<1	Angular-subangular	.3	.2-.3
WhiteClast ₂	White	<1	Angular	.1	<.1
Grey Clast ₃	Lt. Grey	<1	Subangular-Subrounded	.4	.2-.5
Basalt Clast ₄	White Brn/Blk	<1	Angular-Subrounded	.4	.2-.6
Grey & White Clasts	Grey/White	<1	Angular-Subrounded	.2	.1-.2
Salt & Pepper Clast	Blk/White	<1	Subangular	.3	.2-.4

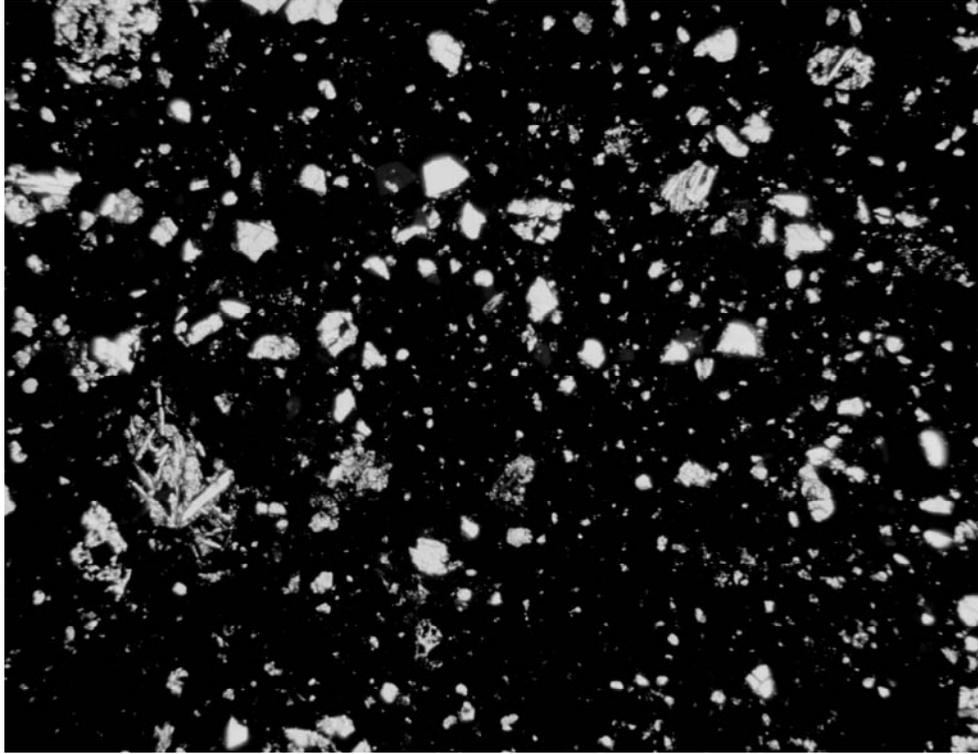
- 1) Elongated tabular crystals (olivine?)
- 2) Powdered sugar texture, crushed anorthosite.
- 3) Submetallic luster. Very fine grained.
- 4) Plagioclase, ilmenite and pyroxene grains; even distribution, equigranular.
- 5) Equigranular. Very fine grained.



10068,0 Original PET Photo S-69-46656

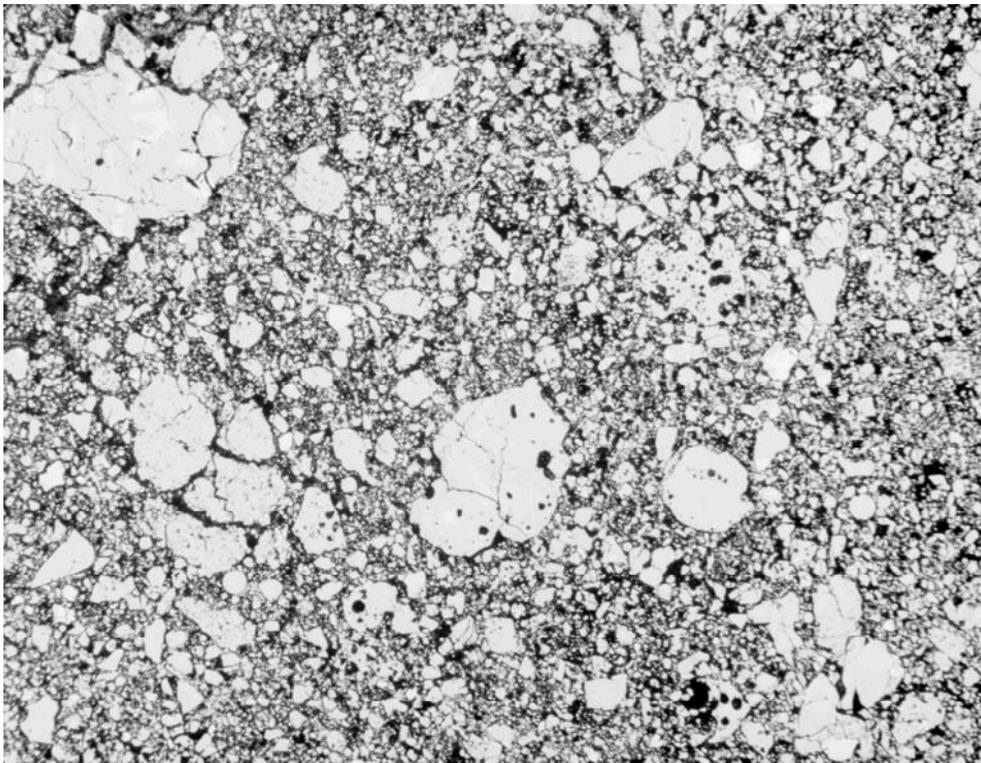


10068,5 S-76-22545



SECTION: 10068,35

Width of field 2.72mm plane light S-76-26328.



SECTION: 10068,35

Width of field 2,72mm reflected light S-76-26329

SUMMARY: Partly devitrified typical breccia with a very dark matrix phase. The matrix is mainly an opaque black phase with part of it grading to a very dark brown. Very few fragments of ilmenite are found in the matrix; all of the major fragments are in the lithic clasts.

MATRIX 51% OF ROCK

<u>PHASE</u>	<u>% SECTION</u>	<u>SHAPE</u>	<u>SIZE (MM)</u>	<u>COMMENTS:</u>
Black to dark brown	100%	-----	<0.001	High glass content very patchy and grades to dark brown.

MINERAL CLASTS 28% OF ROCK

<u>PHASE</u>	<u>RELATIVE ABUNDANCE</u>	<u>SHAPE</u>	<u>SIZE(MM)</u>
Pyroxene ₁	Very abundant	Angular to irregular	0.001-0.3
Plagioclase ₂	Few	Blocky to irregular	0.001-0.3
Opaques ₃	Present	Irregular	0.001-0.1

- 1) Many of the fragments are zoned; highly fractured.
- 2) Many very small fragments; one large fragment.
- 3) A very few isolated in matrix; almost all in clasts.

LITHIC CLASTS 17% 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. Fine-grained basalt consisting of pyroxene, plagioclase and ilmenite.
- b. Coarse-grained basalt consisting of pyroxene, plagioclase and ilmenite.
- c. Fine-grained basalt consisting of pyroxene, plagioclase and ilmenite.
- d. Glass rich matrix enclosing small crystallites of pyroxene and plagioclase.

GLASS CLASTS 4% OF ROCK

<u>TYPE</u>	<u>RELATIVE ABUNDANCE</u>	<u>SHAPE</u>	<u>SIZE(MM)</u>
Yellow-Orange ₅	Very abundant	Spherical to angular	0.001-0.3

- 5) Approximately half spheres or part sphere and half angular shards.

Selected References: Keil (1970)

HISTORY AND PRESENT STATUS OF SAMPLES - 6/28/76

10068 was removed from the Documented Sample container (ALSRC #1004) and split in the Vac Lab. A 100mg sample was sent to PCTL for PET analysis. Remaining pristine samples were re-examined and split in SSPL.

PRISTINE SAMPLES: (All VAC-SSPL)

5	96.70 gm	Piece, Three sides are pitted. The others are fresh.
10	2.88 gm	Chips and fines.
84	35.51 gm	Piece. One surface is pitted.
85	16.54 gm	Three chips. Pits on largest piece.
86	5.26 gm	Fines.

RETURNED SAMPLES:

12	5.92 gm	Chip. No sawed or pitted surfaces.
31	4.55 gm	Chips and fines. Largest chip is 1.0 cm. No sawed surfaces or pits.
33	5.46 gm	Chip. No sawed or pitted surfaces.

CHEMICAL ANALYSES

<u>Element</u>	<u>Number of Analyses</u>	<u>Mean</u>	<u>Units</u>	<u>Range</u>
SiO ₂	1	41.29	PCT	0
Al ₂ O ₃	2	12.18	PCT	.57
TiO ₂	1	7.84	PCT	0
FeO	1	16.47	PCT	0
MnO	2	.225	PCT	.071
MgO	1	6.47	PCT	0
CaO	1	12.17	PCT	0
Na ₂ O	1	.442	PCT	0
Li	1	14.0	PPM	0
Rb	1	3.3	PPM	0
Be	1	1.9	PPM	0

Element	Number of Analyses	Mean	Units	Range
Sr	2	147.75	PPM	35.5
Ba	2	200.0	PPM	100
Sc	2	65.95	PPM	10.1
V	2	52.0	PPM	12.0
Cr ₂ O ₃	2	.328	PCT	.104
Co	2	32.35	PPM	1.30
Ni	1	205.0	PPM	0
Cu	2	13.5	PPM	3.0
Zn	1	22.0	PPM	0
Y	1	108.0	PPM	0
Zr	2	591.0	PPM	218.00
Nb	1	31.0	PPM	0
Ta	1	1.8	PPM	0
Hf	1	11.0	PPM	0
La	2	18.7	PPM	4.60
Ce	1	60.0	PPM	0
Sm	1	14.4	PPM	0
Eu	1	1.8	PPM	0
Tb	1	3.60	PPM	0
Ho	1	6.6	PPM	0
Yb	1	12.2	PPM	0
Lu	1	2.6	PPM	0
U	1	.61	PPM	0
Ga	1	4.70	PPM	0
C	1	165.0	PPM	0
O	1	40.3	PCT	0

Analysts: Ehmann & Morgan, (1970); Goles et al., (1970); Annell & Helz, (1970); Wanless et al., (1970); Epstein & Taylor, (1971).

Age References: Turner, (1971).