61295
Regolith Breccia
187 grams

Figure 1: Photos of freshly created surface and both ends of 61295. Cube is 1 cm. NASA S72-38962, 965 and 967. Large white clast is circled.

Introduction
61295 was chipped off of a large boulder (2 m) on the rim of Plum crater (figure 2). It is a friable light matrix breccia with both light and dark clasts (figure 1). The outer surface of 61295 is rounded and has many zap pits.

Petrography
LSPET (1973) and James (1981) characterized 61295 as a typical regolith breccia. McKay et al. (1986) and Simon et al. (1988) determined the modal mineralogy and concluded that 61295 was a "young regolith breccia". 61295 has a friable and porous matrix and the maturity index (Is/FeO) is 6 (low). The high glass content indicates it was a soil, before it became lithified. Hunter and Taylor (1981) reported minor "rust" in 61295.

Figure 2: Plum Crater with 61295. AS16-114-18412.

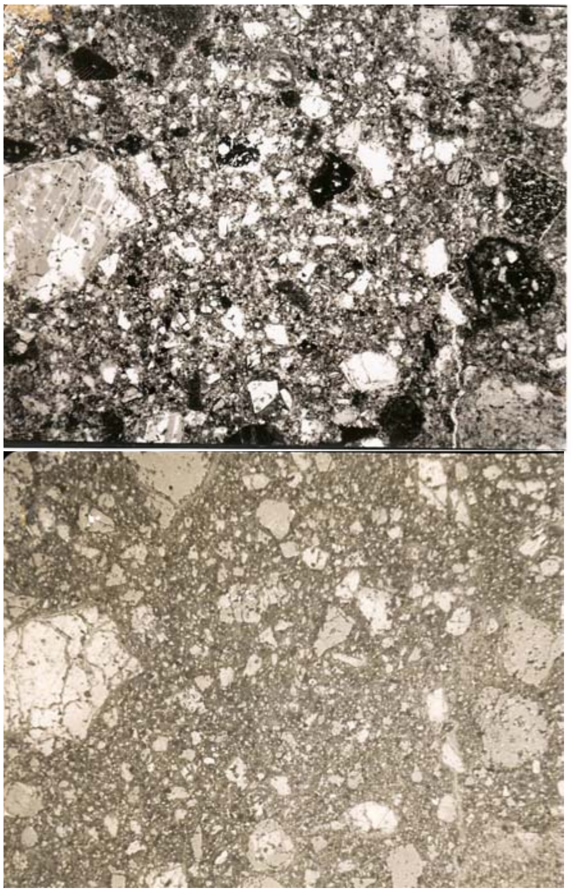


Figure 3: Thin section photomicrographs of 61295,32. Top is transmitted light, bottom is reflected light. About 3 mm across.

The lithic clasts include feldspathic impact melts, feldspathic granulites, aphanitic breccias and poikilitic impact melts. Plagioclase is abundant. Glass shards and beads are present and some glasses have mare basalt composition.

Significant Clast

There is a large white clast on the edge of 61295 (figure 1). Potted butt (,43) and thin section ,45 may be this clast. Ryder and Norman (1980) reported that it is a poikilitic impact melt.

Chemistry

LSPET (1973), Eldridge (1973), Hubbard et al. (1974), McKay et al. (1986) and Simon et al. (1988) reported similar results (table, figure 4).

Moore et al. (1973) reported 55 ppm carbon (figure 5).

Radiogenic age dating

Nyquist et al. (1974) determined Rb-Sr isotopes on the bulk sample, but did not determine an age.

Cosmogenic isotopes and exposure ages

Eldridge et al. (1973) reported the cosmic ray induced activity of ^{26}Al = 54 dpm/kg and ^{22}Na = 42 dpm/kg.

Processing

61295 was processed by breaking it (rather than sawing)(figure 6). There are 13 thin sections.

Mineralogical Mode for 61295

(from McKay et al. 1986) ("Optical")

	>500 micron	20-500 micron
Mare basalt	0	0
KREEP basalt	1.2	0
Plutonic rock frag.	21.9	13
Other lithic	0	7
Granulitc	3.6	0
Poik. Rocks	1.8	2.7
Subophitic	34.3	9.7
Intergranular	5.9	3
Intersertal	3	0.3
Vitric breccia	3.6	1
Frag. Breccia	3	0
Plagioclase	1.8	39
Olivine	0	4
Pyroxene	0.6	2.7
Opaques	0	0
Glass	5.3	14.6
Agglutinate	0	1.3

Mineralogical Mode for 61295

(from Simon et al. 1988)

	20-90 micron	90-1000 micron
Matrix < 20 micron	50.8 %	
Mare basalt	0	0
KREEP basalt	0	0
Feldspathic basalt	0	1.1
Plutonic rock frag.	0.4	5.2
Granulite	0.2	0
Poik. rocks	0.4	1.4
Impact melts	1.2	6.7
Regolith brec.	0.5	0.8
Agglutinate	0.7	3.1
Plagioclase	8.1	3.6
Olivine	1	0.3
Pyroxene	3.6	0.8
Opaques	0.1	0
Glass	5	3.7

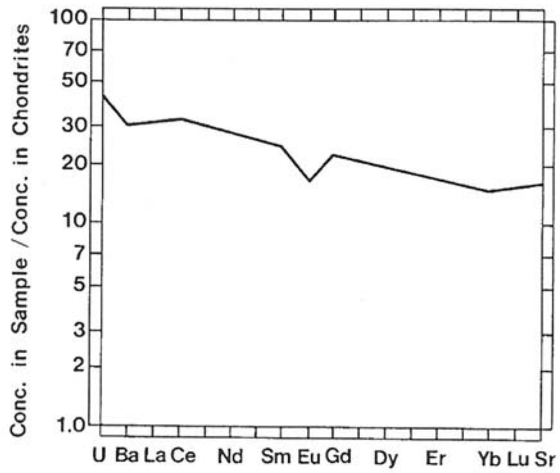
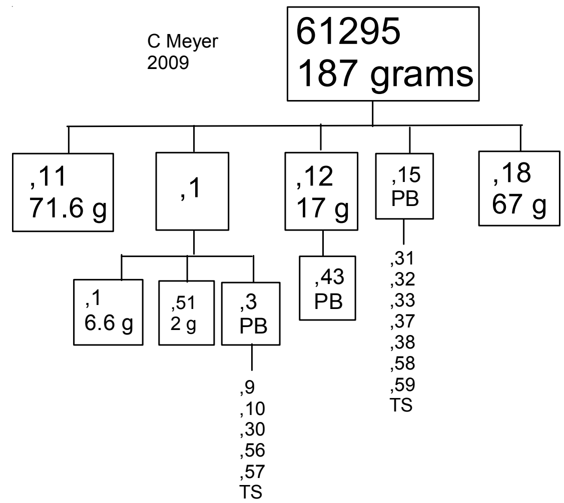


Figure 4: Normalized rare-earth-element diagram for 61295 (precise IDMS data from Hubbard et al. 1973).



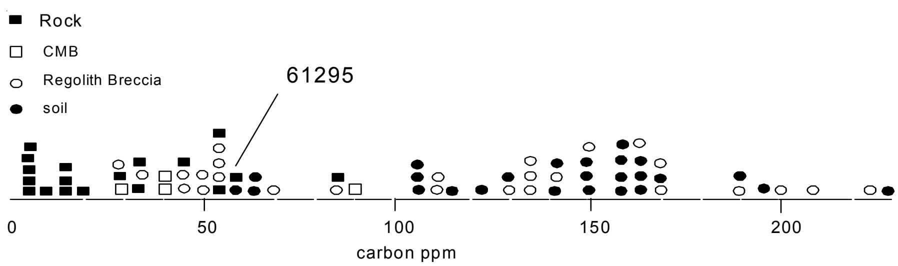


Figure 5: Carbon content of Apollo 16 samples comparing breccias and soils.

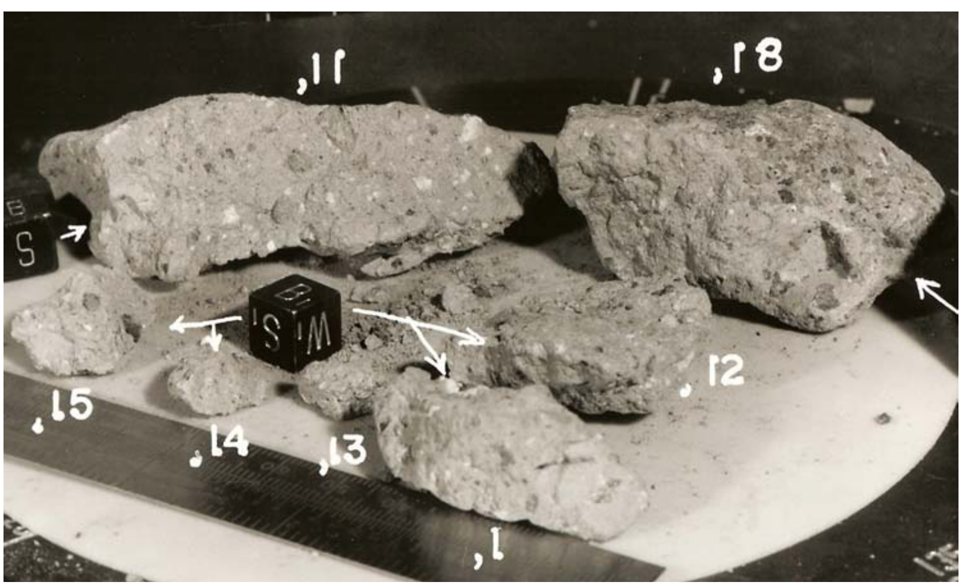


Figure 6: Group photo after breaking 61295 in 1972. Cube is 1 cm for scale. S72-44781.

Table 1. Chemical composition of 61295.

reference	LSPET73		Eldridge73		Simon88	McKay86		Hubbard74	
weight									
SiO2 %	45.19	(d)							
TiO2	0.56	(d)			1.3		(b)		
Al2O3	28.29	(d)			31		(b)		
FeO	4.52	(d)			4.06	4.4	(b)		
MnO	0.06	(d)			0.051		(b)		
MgO	4.72	(d)			4.6		(b)		
CaO	16.16	(d)			16.4	15.9	(b)		
Na2O	0.45	(d)			0.51	0.522	(b)		
K2O	0.09	(d)	0.093	(a)	0.083		(b)	0.1	(c)
P2O5	0.1	(d)							
S %	0.06	(d)							
sum									
Sc ppm					7.1	7.35	(b)		
V					19		(b)		
Cr	570	(d)			506	534	(b)		
Co					16.9	21	(b)		
Ni	114	(d)			210	293	(b)		
Cu									
Zn									
Ga									
Ge ppb									
As									
Se									
Rb	2.3	(d)			1.9		(b)	2.31	(c)
Sr	187	(d)			130	200	(b)	186	(c)
Y	33	(d)							
Zr	143	(d)			100	280	(b)	203	(c)
Nb	8.6	(d)							
Mo									
Ru									
Rh									
Pd ppb									
Ag ppb									
Cd ppb									
In ppb									
Sn ppb									
Sb ppb									
Te ppb									
Cs ppm					0.17	0.09	(b)		
Ba					105	108	(b)	117	(c)
La					7.9	10.6	(b)	10.4	(c)
Ce					20.1	27.3	(b)	25.7	(c)
Pr									
Nd					13.5	17	(b)	16.4	(c)
Sm					3.59	5.08	(b)	4.59	(c)
Eu					1.17	1.21	(b)	1.22	(c)
Gd					4.9		(b)	5.76	(c)
Tb					0.81	0.92	(b)		
Dy					5.5		(b)	5.99	(c)
Ho					1.1		(b)		
Er								3.55	(c)
Tm									
Yb					2.5	3.16	(b)	3.25	(c)
Lu					0.35	0.455	(b)		
Hf					2.5	3.6	(b)		
Ta					0.37	0.39	(b)		
W ppb									
Re ppb									
Os ppb									
Ir ppb					3.5	5.6	(b)		
Pt ppb									
Au ppb					0.82	5.6	(b)		
Th ppm	1	(d)	1.48	(a)	1.16	1.63	(b)		
U ppm			0.39	(a)	0.35	0.4	(b)	0.495	(c)

technique: (a) radiation counting, (b) INAA, (c) IDMS, (d) XRF

References for 61295

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