

63595 – 2.1 grams

63588 – 2.4 grams

Regolith Breccia



Figure 1: Photo of 63595. Scale in mm. S80-37440



Figure 2: Photo of 63588. Scale is in mm. S80-37421.

Introduction

McKay et al. (1986) found that 63588 and 63595 were similar young regolith breccias, because they had low $^{40}\text{Ar}/^{36}\text{Ar}$. They are rake samples from the soil near Shadow Rock, station 13 –see section on 63500 for comparison.

Petrography

63588 and 63595 are polymict fragmental breccias, with angular clasts of plagioclase, brown glassy breccias, aphanitic melts and feldspathic granulite. Mineral modes are given in Mckay et al. (1986).

Phinney et al. (1976) used SEM petrography to describe the fine details of 63595. Since it has fine filaments of glass, it has not been sintered.

Mineralogical Mode for 63595

(from McKay et al. 1986) (“Optical”)

	>500 micron	20-500 micron
Mare basalt	0	0
KREEP basalt	0	
Plutonic rock frag.	24	10.1
Other lithic	0	6.9
Granulitic	0	
Poik. Rocks	9	12.2
Subophitic	8	1.9
Intergranular		3.8
Intersertal	0	0
Regolith bx.	46	
Vitric breccia		3.2
Frag. Breccia		0.3
Plagioclase		54.3
Olivine		5.7
Pyroxene		
Opaques		0.3
Glass		11
Agglutinate		

Mineralogical Mode for 63588

(from McKay et al. 1986) (“Optical”)

	>500 micron	20-500 micron
Mare basalt	0	0
KREEP basalt	0	1.3
Plutonic rock frag.	31.7	17
Other lithic	0	6.7
Granulitic	0	0.7
Poik. Rocks	0	2.7
Subophitic		3.7
Intergranular		2
Intersertal	0	0
Vitric breccia	19.5	4.3
Frag. Breccia	19.5	0
Plagioclase		43.3
Olivine		5
Pyroxene		4.3
Opaques		0.6
Glass	29.3	14.3
Agglutinate		

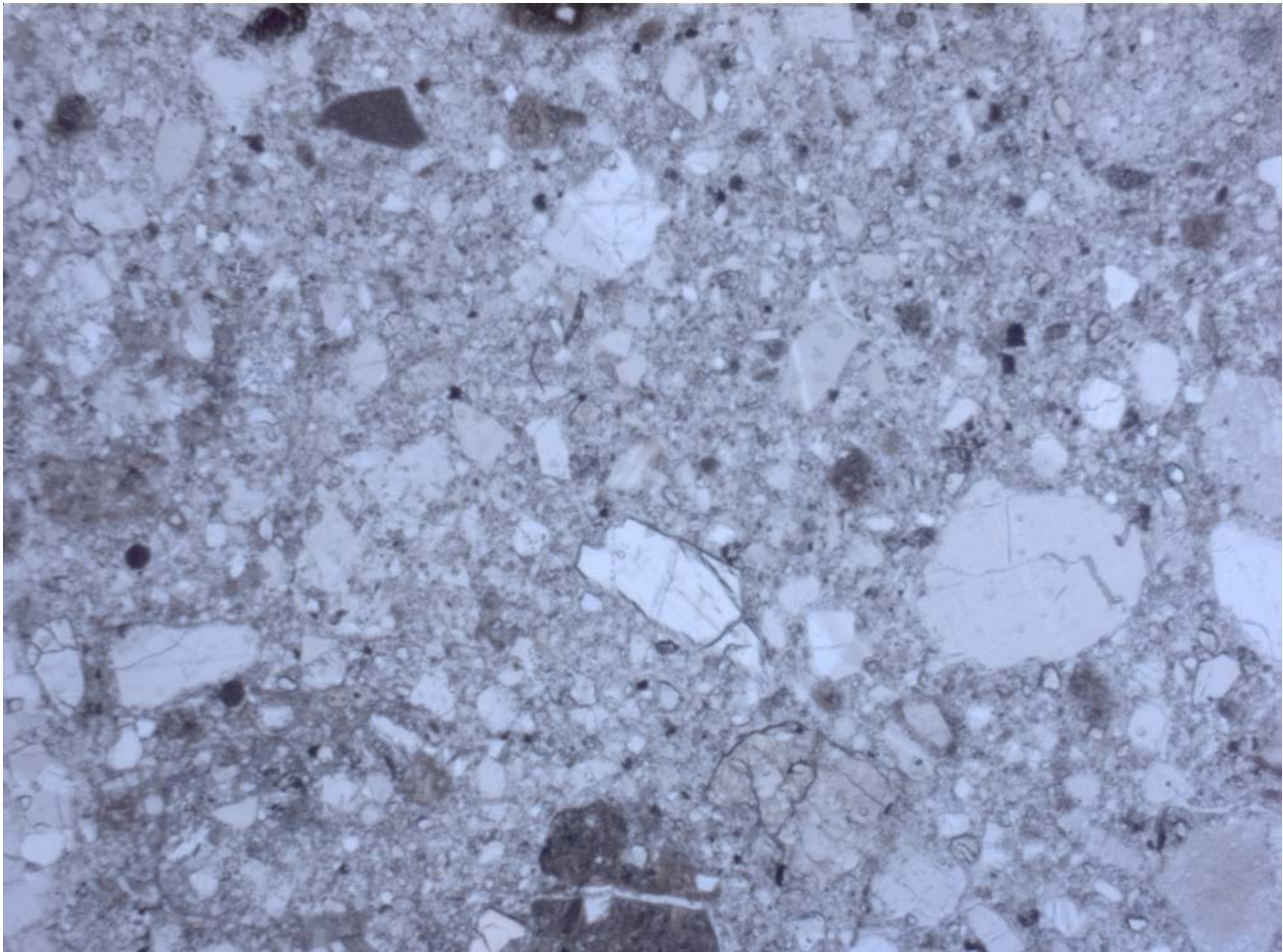


Figure 3: Thin section photomicrograph of 63595 by C Meyer. 2 mm across, partially polarized.

McKay et al. (1986) and Joy et al. (2012) reported the maturity index $I_s/FeO = 0.4$ (very immature) for both samples. However, 63588 has more glass than 63595.

Chemistry

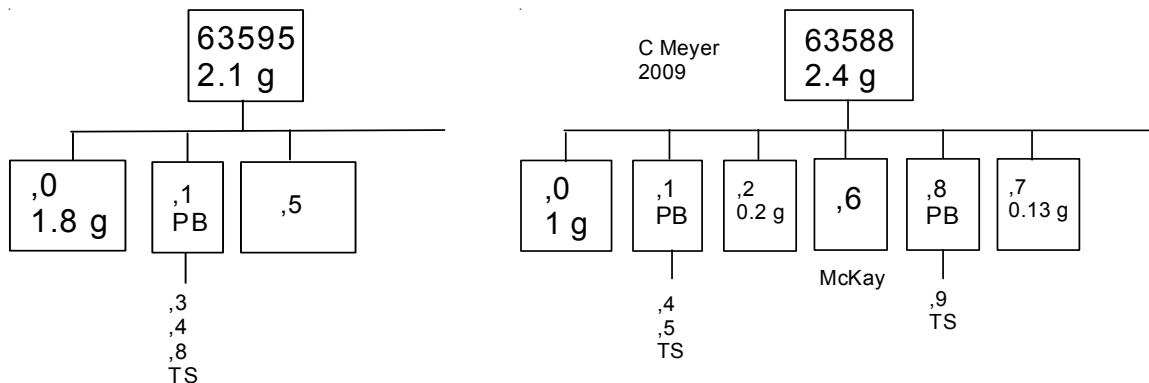
The chemical composition of 63588 and 63595 were reported by McKay et al. (1986).

Other Studies

McKay et al. (1986) reported the rare gas content and isotopic ratios for 63588 and 63595.

Processing

There are three thin sections of each sample.



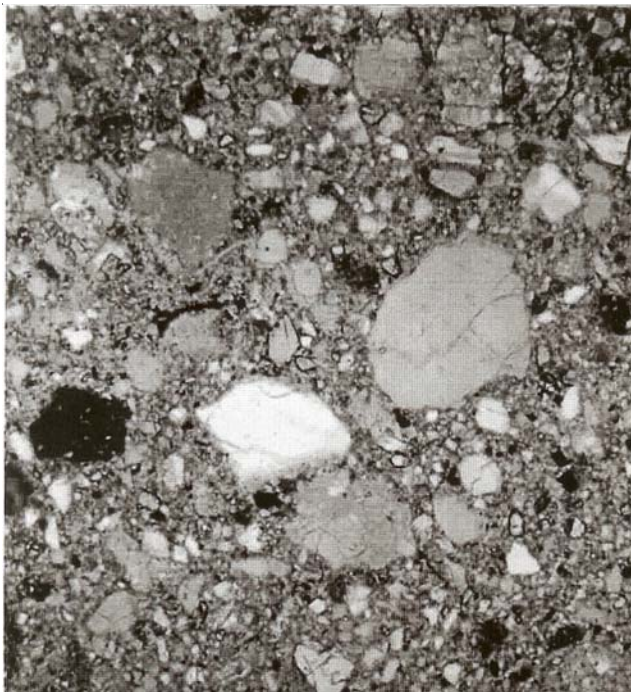


Figure 4: Photo of thin section of 63595 with glass spheress.

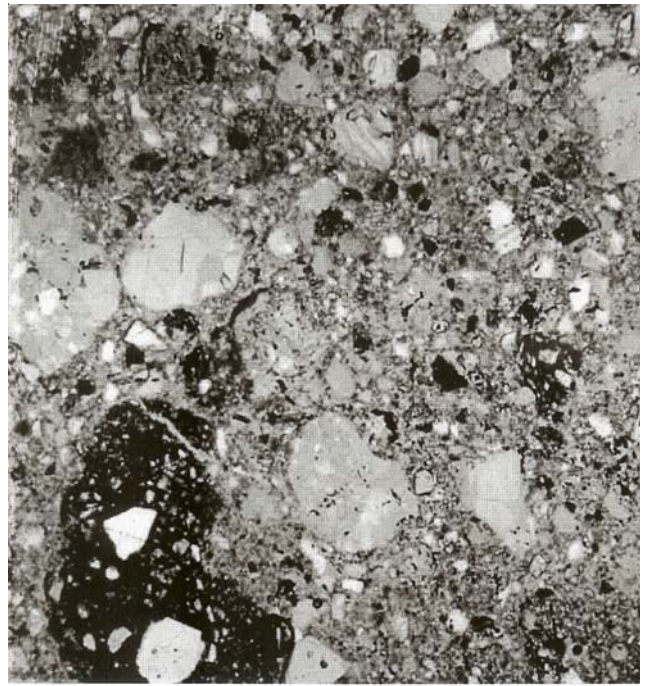


Figure 5: Photo of thin section of 63588. Width of field is 2 mm.

Table 1. Chemical composition of 63595.

<i>reference weight</i>	McKay86	
SiO ₂ %		
TiO ₂	0.3	(a)
Al ₂ O ₃	29.9	(a)
FeO	3.09	(a)
MnO	0.044	(a)
MgO	4.15	(a)
CaO	16.8	(a)
Na ₂ O	0.48	(a)
K ₂ O		
P ₂ O ₅		
S %		
<i>sum</i>		
Sc ppm	5.21	(a)
V	113	(a)
Cr	380	(a)
Co	10.8	(a)
Ni	114	(a)
Cu		
Zn		
Ga		
Ge ppb		
As		
Se		
Rb		
Sr	191	(a)
Y		
Zr	90	(a)
Nb		
Mo		
Ru		
Rh		
Pd ppb		
Ag ppb		
Cd ppb		
In ppb		
Sn ppb		
Sb ppb		
Te ppb		
Cs ppm	0.08	(a)
Ba	64	(a)
La	5.46	(a)
Ce	14.2	(a)
Pr		
Nd	8	(a)
Sm	2.5	(a)
Eu	1.125	(a)
Gd		
Tb	0.49	(a)
Dy		
Ho		
Er		
Tm		
Yb	1.73	(a)
Lu	0.249	(a)
Hf	1.88	(a)
Ta	0.215	(a)
W ppb		
Re ppb		
Os ppb		
Ir ppb	2.6	(a)
Pt ppb		
Au ppb	2.3	(a)
Th ppm	0.83	(a)
U ppm	0.2	(a)
<i>technique:</i>	(a) INAA	

Table 2. Chemical composition of 63588.

<i>reference weight</i>	McKay86	
SiO ₂ %		
TiO ₂	0.37	(a)
Al ₂ O ₃	28.9	(a)
FeO	3.64	(a)
MnO	0.05	(a)
MgO	4.95	(a)
CaO	16	(a)
Na ₂ O	0.49	(a)
K ₂ O		
P ₂ O ₅		
S %		
<i>sum</i>		
Sc ppm	5.65	(a)
V	14	(a)
Cr	449	(a)
Co	16.3	(a)
Ni	199	(a)
Cu		
Zn		
Ga		
Ge ppb		
As		
Se		
Rb		
Sr	196	(a)
Y		
Zr	100	(a)
Nb		
Mo		
Ru		
Rh		
Pd ppb		
Ag ppb		
Cd ppb		
In ppb		
Sn ppb		
Sb ppb		
Te ppb		
Cs ppm	0.09	(a)
Ba	86	(a)
La	8.41	(a)
Ce	21.3	(a)
Pr		
Nd	13	(a)
Sm	3.84	(a)
Eu	1.175	(a)
Gd		
Tb	0.68	(a)
Dy		
Ho		
Er		
Tm		
Yb	2.54	(a)
Lu	0.371	(a)
Hf	2.91	(a)
Ta	0.31	(a)
W ppb		
Re ppb		
Os ppb		
Ir ppb	4.9	(a)
Pt ppb		
Au ppb	3.4	(a)
Th ppm	1.31	(a)
U ppm	0.28	(a)
<i>technique:</i>	(a) INAA	

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