

15505
Regolith Breccia
1147 grams

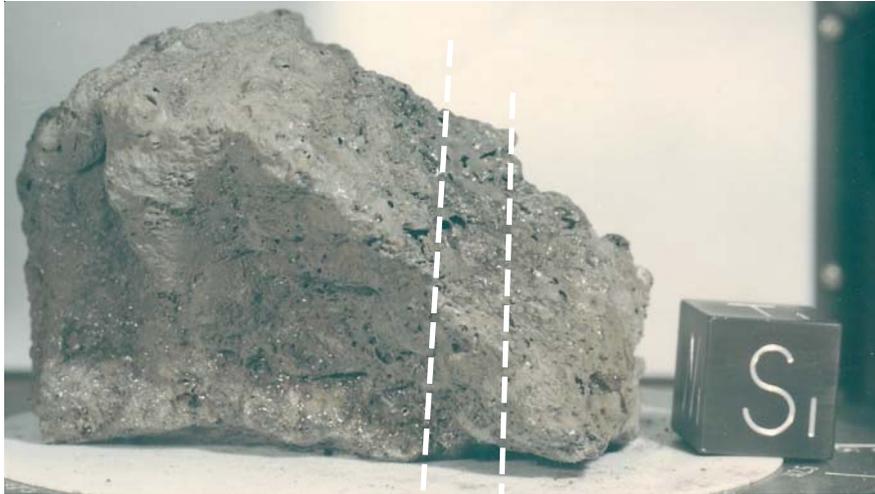


Figure 1: Photo of 15505 with location of slab indicated. Cube is 1 inch. S71-47366



Figure 2: Surface photo of 15505. Gnomon is 50 cm. AS15-82-11105.

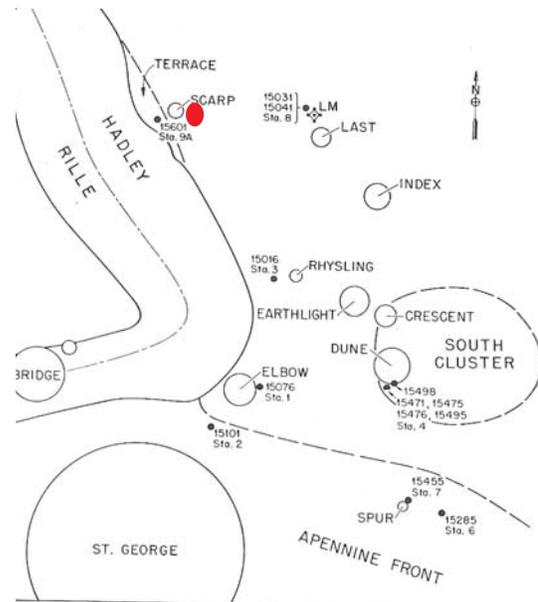


Figure 3: Map of Apollo 15 showing location of 15505.

Introduction

Large lunar breccia 15505 is from the area near Hadley Rille where a large field of mare basalts were found (figure 3). It is similar to 15558 – from same location. It is a glass matrix breccia with an abundance for mare basalt clasts (figures 1 - 7).

Petrography

Fruiland (1985), Simon et al. (1986) and McKay et al. (1989) compared 15505 with other Apollo 15 soil breccias. McKay et al. reported that the maturity index for 15505 was $I_s/FeO = 26$ and Simon et al. reported the mode.



Figure 4: Photos of 15505. 71-47364



Figure 5: Photo of frothy glass surface of 15505. S71-44461

Wilshire and Moore (1974) and Michel-Levy and Jahann (1973) studied the glass coating, finding that it was continuous with the interior veins and probably not a glass splash.

Engelhardt et al. (1973) found that 15505 was made up of primarily mare basalt components. A single large clast of mare basalt was exposed in the slab, but has apparently not been studied.

Chemistry

15505 is one of the most iron-rich breccias from Apollo 15 (figure 11). It has a REE pattern like that of soil from the Apollo 15 site (figure 12).

Moore et al. (1973) reported 104 ppm carbon (figure 6).

Winzer et al. (1978) reported the composition of the glass coat (but it is surely not homogeneous).

Mode for 15505

(Simon et al. 1986)

Matrix	<20 micron	40.1 %
	20-90 micron	90-1000 micron
Mare basalt	0.3 %	6.5
Plutonic Rx.	0.2	2.0
Feld. CMB	-	0.2
Feld. Basalt		-
KREEP basalt		0.3
Granulitic/Poik.	0.1	0.2
Reg Bx.	-	1.0
Agglutinate	-	-
Pyroxene	18.2	5.5
Olivine	3.1	1.0
Plagioclase	6.1	2.3
Opaque	1.4	
Glass	7	4

Radiogenic age dating

Schaeffer and Schaeffer (1977) reported Ar 39/40 data but could not obtain an age.

Cosmogenic isotopes and exposure ages

Rancitelli et al. (1972) determined the cosmic-ray-induced activity of $^{22}\text{Na} = 44 \text{ dpm/kg}$, $^{26}\text{Al} = 44 \text{ dpm/}$

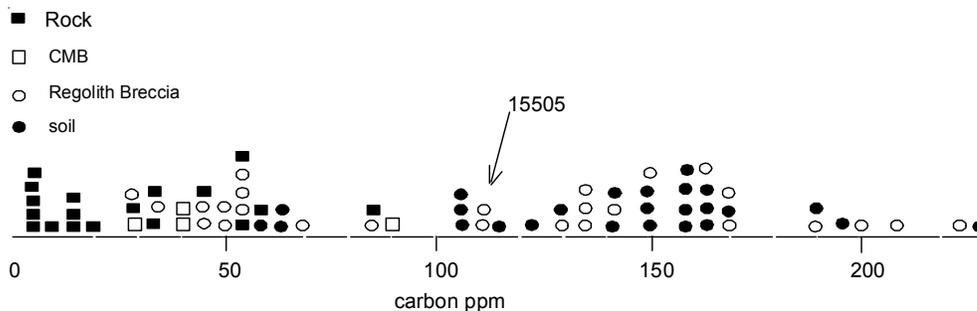


Figure 6: Carbon content.



Figure 7: Photo of slab 15505,4. S72-15536.



Figure 8: Photo of slab 15505,4. Clast is 1 inch. S72-15535.

kg. and $^{54}\text{Mn} = 42$ dpm/kg. the Ar data of Schaeffer and Schaeffer should yield an exposure age.

Processing

A slab was cut through the middle of 15505. There are 9 thin sections.



Figure 9: Photo of sawn surface of small butt end of 15505,3. S72-15536



Figure 10: Photo of 15505,0 after slab was cut, and 15505,49 broke off. Cube is 1 inch. S93-40237

Table 1. Chemical composition of 15505

reference weight	Simon86	Laul73	Rancitelli72	McKay89	Silver73	
SiO ₂ %						
TiO ₂	1.6	(a) 1.6	(a)	1.6	(a)	
Al ₂ O ₃	12.3	(a) 12.4	(a)	12.4	(a)	
FeO	16	(a) 17.2	(a)	17.4	(a)	
MnO	0.21	(a) 0.212	(a)	0.21	(a)	
MgO	11.4	(a) 9	(a)	9	(a)	
CaO	10.2	(a) 10.9	(a)	9.9	(a)	
Na ₂ O	0.39	(a) 0.365	(a)	0.4	(a)	
K ₂ O	0.16	(a) 0.16	(a) 0.186	(b)		
P ₂ O ₅						
S %						
sum						
Sc ppm	30.5	(a) 32	(a)	33.1	(a)	
V	130	(a) 150	(a)	150	(a)	
Cr	2915	(a) 3024	(a)	3310	(a)	
Co	46.1	(a) 53	(a)	49.6	(a)	
Ni	200	(a)		205	(a)	
Cu						
Zn						
Ga						
Ge ppb						
As						
Se						
Rb						
Sr	110	(a)		100	(a)	
Y						
Zr	270	(a) 570	(a)	290	(a)	
Nb						
Mo						
Ru						
Rh						
Pd ppb						
Ag ppb						
Cd ppb						
In ppb						
Sn ppb						
Sb ppb						
Te ppb						
Cs ppm				0.21	(a)	
Ba	220	(a) 150	(a)	210	(a)	
La	20.5	(a) 21	(a)	20.8	(a)	
Ce	50	(a) 57	(a)	55	(a)	
Pr						
Nd	34	(a)		32	(a)	
Sm	9.35	(a) 10	(a)	10.1	(a)	
Eu	1.2	(a) 1.2	(a)	1.25	(a)	
Gd						
Tb	2.05	(a) 1.7	(a)	1.99	(a)	
Dy	13.5	(a) 6.4	(a)			
Ho	2.9	(a)				
Er						
Tm	1.1	(a)				
Yb	6.89	(a) 7.5	(a)	6.9	(a)	
Lu	0.97	(a) 1.1	(a)	0.97	(a)	
Hf	6.7	(a) 9	(a)	7.9	(a)	
Ta	0.9	(a) 0.9	(a)	1.04	(a)	
W ppb						
Re ppb						
Os ppb						
Ir ppb				7.1	(a)	
Pt ppb						
Au ppb				3.8	(a)	
Th ppm	3.3	(a) 2.8	(a) 3.64	(b) 3.5	(a) 3.57	3.565 (c)
U ppm	0.82	(a) 0.9	(a) 0.94	(b) 0.87	(a) 0.984	0.975 (c)

technique: (a) INAA, (b) radiation count., (c) IDMS

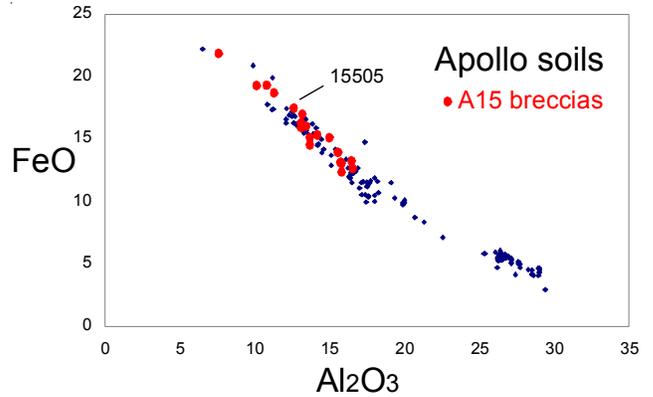


Figure 11: Composition of 15505 compared with that of Apollo soils and Apollo 15 breccias.

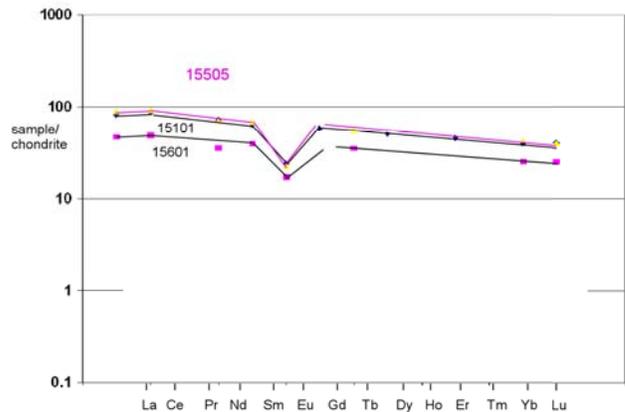
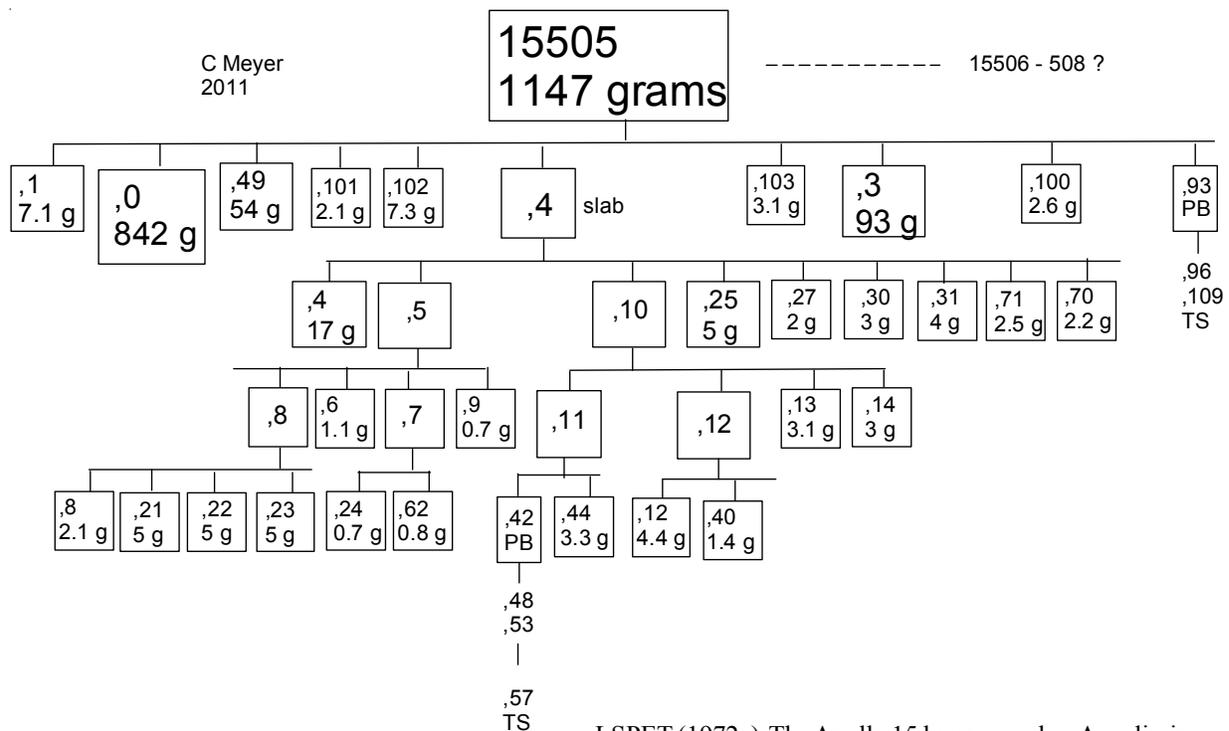


Figure 12: Normalized rare-earth-element diagram for 15505 compared with that of Apollo 15 soils.



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