

15298
Regolith Breccia
1731 grams



Introduction

15298 is a brown glass matrix breccia from station 6, Apollo 15, broadly similar to 15295 and 15299 and numerous other breccias returned from this site. Fractures in 15298 have slickensides.

The Apollo 15 catalog by Ryder (1985) contains additional information.

Petrography

A careful modal analysis of both the coarse and fine fractions of 15298 is provided by McKay et al. (1989) and compared with other regolith breccias. They report 13% agglutinates in the coarse fragments and 53% vitric component in the fine fraction (<500 microns). They also disaggregated the sample by freeze-thaw cycles and performed a grain size analysis. A small chip (8 mg) was used to determine the rare gas content and maturity index ($I_s/FeO = 59$). The high solar-wind,

rare-gas content, high I_s/FeO and agglutinate content show that this breccia, and the others like it, was formed from compressed lunar soil. Since the chemical composition matches the local soil, the breccia probably was locally derived (Spur Crater?).

Chemistry

Christian et al. (1976) and Korotev in McKay et al. (1989) have provided an analysis of the matrix of 15298 (table 1, figure 3). The high KREEP component was noted by the analysts.

Other Studies

Flory et al. (1972) studied the release of carbon compounds in 15298.

Bogard and Nyquist (1972) and Bogard in McKay et al. (1989) reported detail rare gas analysis and

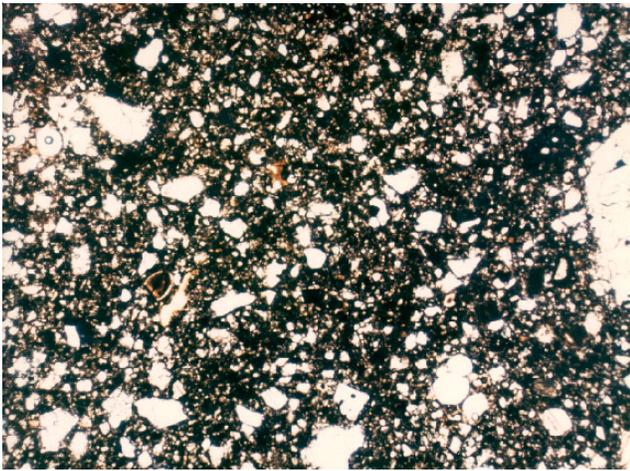


Figure 2: Photomicrograph of thin section of 15298. Field of view is 2.4 mm.

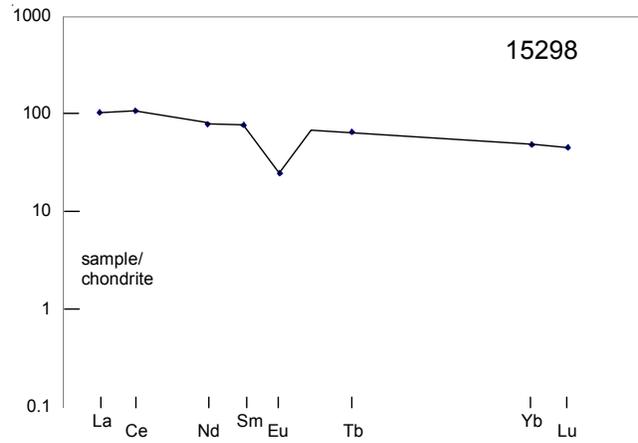


Figure 3: Normalized rare-earth-element composition diagram for 15298 (data from Korotev, see McKay et al. 1989).

concluded that “15298 must have existed on the surface for most of its exposure” due to high ^{131}Xe .

Table 1. Chemical composition of 15298.

<i>reference weight</i>	McKay 89		Christian 76	
SiO ₂ %			45.97	(b)
TiO ₂	1.5	(a)	1.52	(b)
Al ₂ O ₃	15.8	(a)	15.93	(b)
FeO	13.1	(a)	12.96	(b)
MnO	0.17	(a)	0.2	(b)
MgO	11.1	(a)	10.96	(b)
CaO	10.5	(a)	11.03	(b)
Na ₂ O	0.46	(a)	0.8	(b)
K ₂ O			0.17	(b)
P ₂ O ₅			0.15	(b)
S %				
<i>sum</i>				
Sc ppm	24.4	(a)	25	(b)
V	85	(a)	62	(b)
Cr	2390	(a)	1984	(b)
Co	42.5	(a)	44	(b)
Ni	243	(a)	200	(b)
Cu			12	(b)
Zn			13	(b)
Ga			4.3	(b)
Ge ppb				
As				
Se				
Rb			5.3	(b)
Sr	150	(a)	140	(b)
Y			90	(b)
Zr	390	(a)	440	(b)
Nb			25	(b)
Mo				
Ru				
Rh				
Pd ppb				
Ag ppb				
Cd ppb				
In ppb				
Sn ppb				
Sb ppb				
Te ppb				
Cs ppm	0.26	(a)		
Ba	246	(a)	330	(b)
La	24.7	(a)	15	(b)
Ce	66	(a)		
Pr				
Nd	36	(a)		
Sm	11.5	(a)		
Eu	1.4	(a)		
Gd				
Tb	2.4	(a)		
Dy				
Ho				
Er				
Tm				
Yb	8	(a)	12	(b)
Lu	1.12	(a)		
Hf	9.2	(a)		
Ta	1.11	(a)		
W ppb				
Re ppb				
Os ppb				
Ir ppb	8	(a)		
Pt ppb				
Au ppb	1.8	(a)		
Th ppm	5.2	(a)		
U ppm	1.2	(a)		

technique (a) INAA, (b) combined XRF, semimicro chem., emission spec.