15308

Impact melt

1.7 grams

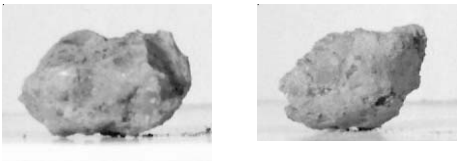


Figure 1: Two views of 15308 before it was chipped. S71-43065 and 66. Sample is 1 cm

Introduction

Lunar sample 15308 is a 1 cm particle sieved from soil sample 15301 from the rim of Spur Crater on the Apennine Front. It is a clast-rich impact melt rock with high content of trace elements. It has not been successfully dated.

Petrography

Simonds et al. (1975) termed 15308 a "cataclastic annealed rock with either a poikilitic or granulitc texture". Dowty et al. (1973) termed this sample "anorthositic norite", but it appears they were studying the large white clast– see pyroxene diagram. Ryder and Spudis (1987) describe the matrix as "fine-grained feathery, or variolitic melt with skelytal mafic grains and lathy plagioclases". Much of the groundmass is glassy.

Ryder (1985) gives a complete description and stated that 15308 was similar to the dark matrix of 15445 and 15455.

The white clast is a highly shocked anorthosite (portion included in figure 2). Dowty et al. (1973) and Nehru et al. (1974) reported mineral analyses.

Chemistry

Murali et al. (1977) and Ryder and Spudis (1987) give analysis of 15308 (table). The REE pattern is dominated by KREEP (figure 4).

Radiogenic age dating

Dalrymple and Ryder (1993) attempted to date 15308 by Ar/Ar, but were unable to obtain a flat plateau or age (figure 5).

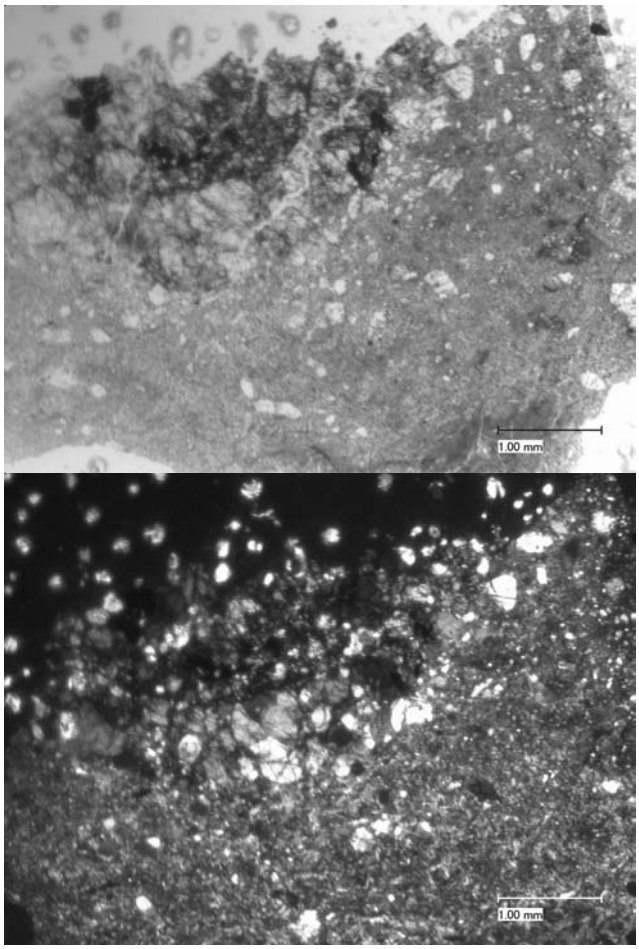


Figure 2: Photomirgraphs of thin section 15308,2 @ 50x by C Meyer.

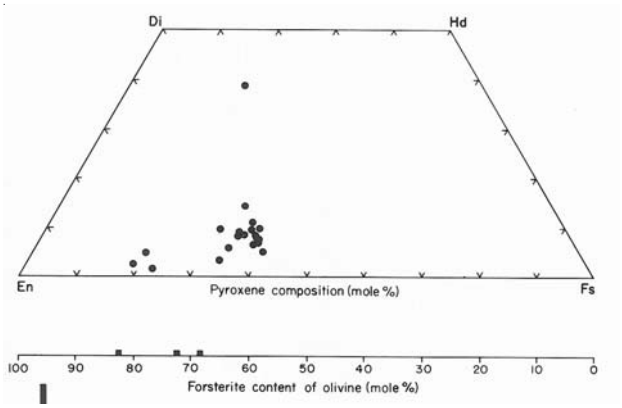


Figure 3: Composition of olivine and pyroxene in 15308 matrix and clast (Dowty et al. 1973).

Table 1. Chemical composition of 15308

reference	Ryder+Spudis87				Murali77		Dowty73	
weight								
SiO2 %			45.7	(b)			44.1	(c)
TiO2			0.96	(b)	1.3	(a)	1.24	(c)
Al2O3			20.5	(b)	18.7	(a)	27.3	(c)
FeO	8	7.5	7.5	(a)	8.7	(a)	5.9	(c)
MnO			0.093	(b)	0.1	(a)		(c)
MgO			11.7	(b)	13.4	(a)	6.7	(c)
CaO			12	(b)	10.1	(a)	13.3	(c)
Na2O			0.56	(b)	0.58	(a)	0.63	(c)
K2O			0.275	(b)	0.26	(a)	0.17	(c)
P2O5							0.11	(c)
S %								
sum								
Sc ppm	14.2	13.2	13.6	(a)	14.5	(a)		
V					41	(a)		
Cr	993	1130	1184	(a)	1080	(a)	3150	(c)
Co	22.9	20.9	23.7	(a)	23	(a)		
Ni		177	191	(a)	149	(a)		
Cu								
Zn								
Ga								
Ge ppb								
As								
Se								
Rb	12	15	10	(a)				
Sr								
Y								
Zr		280	211	(a)	405	(a)		
Nb								
Mo								
Ru								
Rh								
Pd ppb								
Ag ppb								
Cd ppb								
In ppb								
Sn ppb								
Sb ppb								
Te ppb								
Cs ppm	0.34	0.25	0.15	(a)				
Ba	312	367	337	(a)	277	(a)		
La	28	30.2	26.8	(a)	28.6	(a)		
Ce	74	79	66	(a)	88	(a)		
Pr								
Nd	46	50	46	(a)				
Sm	12.6	13.3	12.3	(a)	12.5	(a)		
Eu	1.78	1.89	1.77	(a)	1.82	(a)		
Gd								
Tb	2.8	2.9	2.4	(a)	2.5	(a)		
Dy					15	(a)		
Ho								
Er								
Tm								
Yb	9.5	9.5	8.9	(a)	9.3	(a)		
Lu	1.39	1.43	1.35	(a)	1.28	(a)		
Hf	14.7	9.8	8.9	(a)	10.7	(a)		
Ta	1.1	1.3	1.1	(a)	1.4	(a)		
W ppb								
Re ppb								
Os ppb								
Ir ppb								
Pt ppb								
Au ppb					1.2	(a)		
Th ppm	4.9	5.8	4.9	(a)	5.1	(a)		
U ppm	2	2	1.7	(a)				

technique: (a) INAA, (b) fused-bead e-probe, (c) broad-beam e-probe

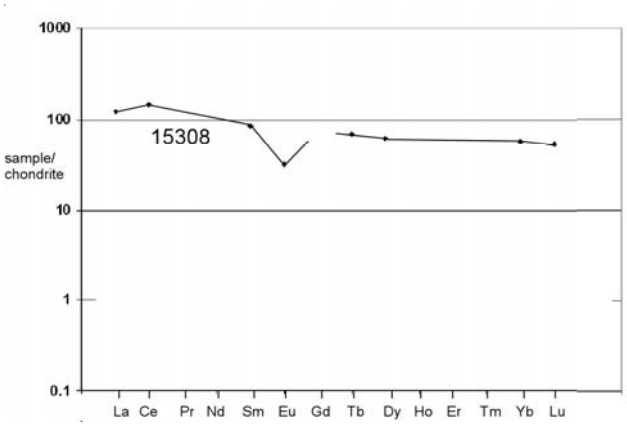


Figure 4: Normalized REE diagram for 15308.

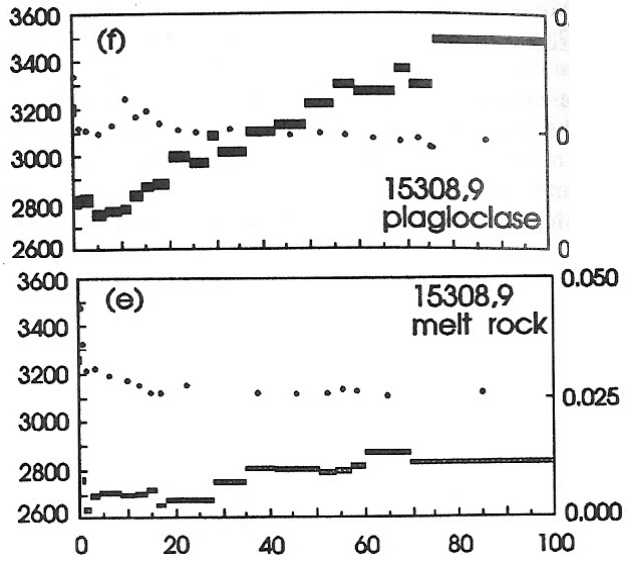
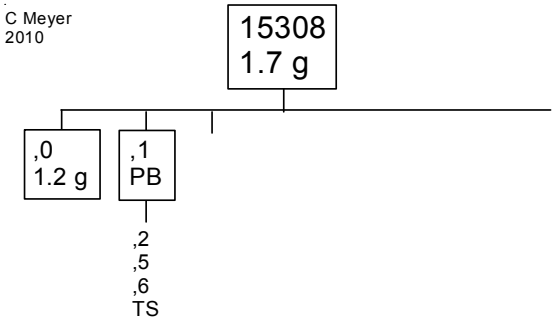


Figure 5: An attempt to determined the age by Ar/ Ar failed (Dalrymple and Ryder 1993).



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