

74235
Vitrophric Basalt
59 grams



Figure 1: Photo of 74235. Cube is 1 cm. S73-16017

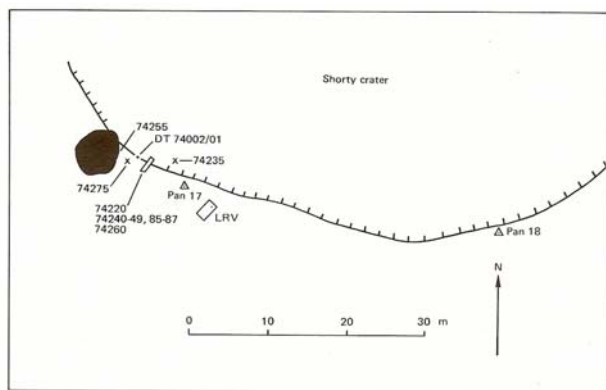


Figure 2: Map of station 4, Apollo 17.

Transcript

(while the LMP was discussing the core with CC, the CDR made a discovery)

CMP What is that right there?

LMP Oh, it's a piece of glass, probably.

CDR Boy, it sure is. I've got a little piece of glass in my pocket (12E).

CDR There was this little piece of black glass – solid black glass.

Introduction

This sample was picked up from the lunar surface at the location of the trench on the rim Shorty Crater (see transcript in section 74240). It was originally thought to be a big piece of glass and was stowed in the astronaut's pocket, then transferred to a bag in the LM after the EVA, where it was found to actually be a piece of fine-grained or aphanitic basalt. During PET it was described as having a metallic sheen (figure 1). Some of the walls of 74235 are defined by very large vesicles (3 cm dia.?).

74235 has an exposure age (175 m.y.), which is much longer than the age of Shorty Crater (~19 m.y.).

Petrography

74235 is described in the catalogs by Butler (1973) and Neal and Taylor (1993). Brown et al. (1975) classified it as type 1a (high-Ti) and gave a mineral mode. Thin blades of ilmenite and skeletal phenocrysts of olivine and pyroxene are scattered throughout a matrix of glass and feathery minerals. The sample represents a rapidly quenched volcanic liquid.

Usselman et al. (1975) determined the cooling rate of 150-250 deg./hr. for 74235 by dynamic experiments.

Chemistry

Rose et al. (1975), Rhodes et al. (1976), Shih et al. (1975) and Neal (2001) have reported chemical analyses of 74235 (table 1, figures 4, 5, and 6). It is a type A magma.

Gibson et al. (1976) reported 2030 ppm S.

Radiogenic age dating

Apollo 17 mare basalts are generally considered 3.72 ± 0.04 b.y. old (see Paces et al. 1991).

Cosmogenic isotopes and exposure ages

Eugster et al. (1977) determined the exposure age of 74235 as 175 ± 25 m.y. by the ^{81}Kr method. Eberhardt et al. (1975) reported 180 m.y.

Other Studies

The rare gas content and isotopic ratios were determined by Eugster et al. (1977).

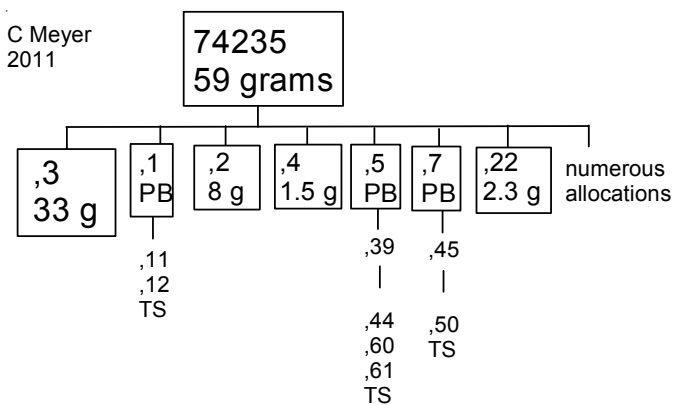
O'Hara and Humphries (1975) studied the early crystallization of armalcolite.

Nyquist et al. (1975) determined the Rb, Sr and $\text{Sr}^{87/86}$.

Nunes et al. (1974) determined U, Th and Pb isotopes.

Processing

There are 16 thin sections of 74235.



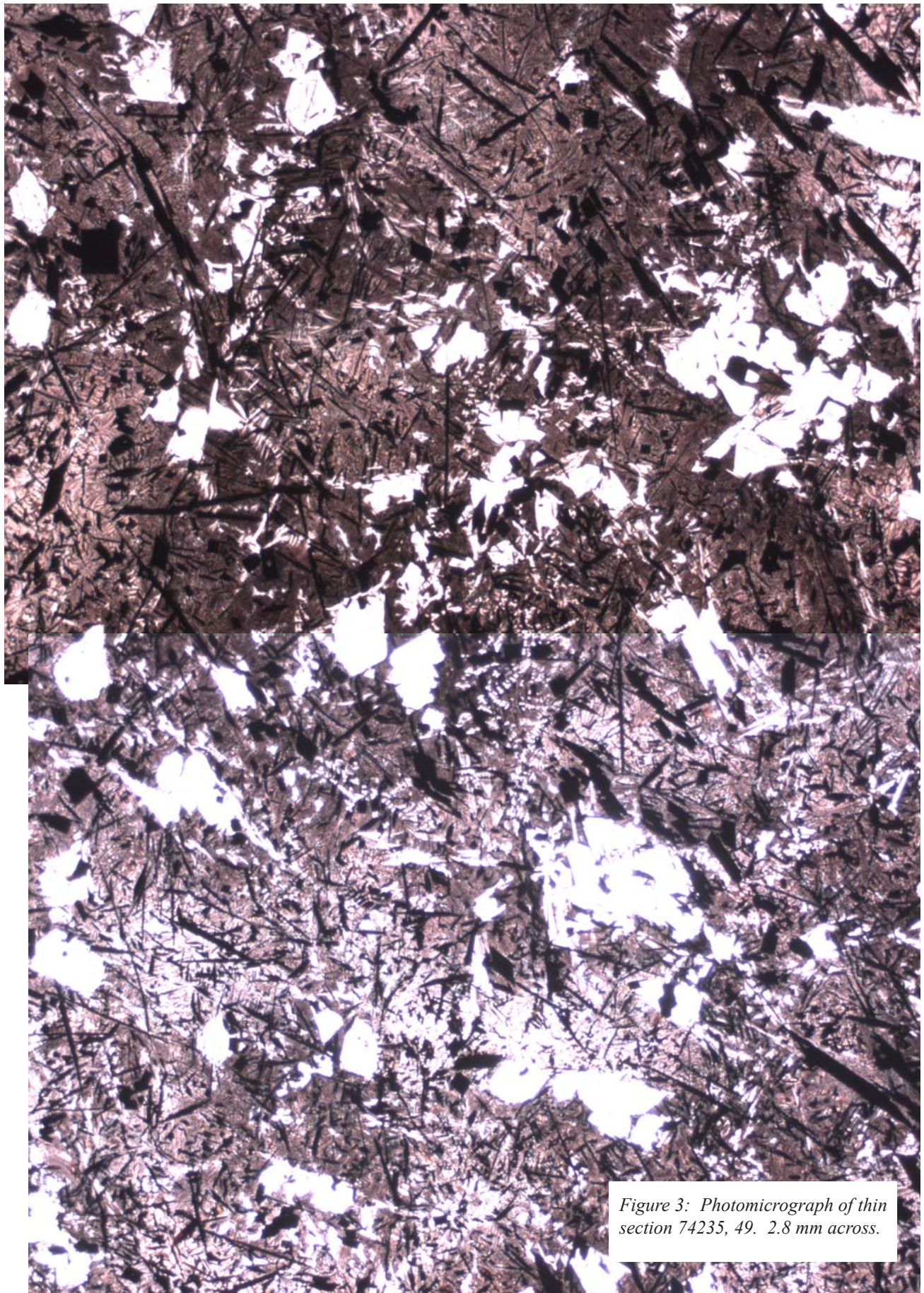


Figure 3: Photomicrograph of thin section 74235, 49. 2.8 mm across.



Lunar Sample Compendium
C Meyer 2011

Table 1. Chemical composition of 74235.

reference weight	Rhodes76	Neal2001	Shih75 Wiesmann76	Rose75
SiO ₂ %	38.62 (a)			39.42 (d)
TiO ₂	12.17 (a)			12.39 (d)
Al ₂ O ₃	8.61 (a)			9.21 (d)
FeO	19.32 (a)			18.55 (d)
MnO	0.28 (a)			0.27 (d)
MgO	8.35 (a)			8.67 (d)
CaO	10.7 (a)			10.85 (d)
Na ₂ O	0.4 (a)			0.37 (d)
K ₂ O	0.07 (a)		0.067 (c)	0.08 (d)
P ₂ O ₅	0.05 (a)			0.05 (d)
S %	0.15 (a)			
sum				
Sc ppm		85 (b)	81.4 (e)	76 (d)
V		137 (b)		61 (d)
Cr	3490 (a)	2906 (b)		3216 (d)
Co		23 (b)	19 (e)	30 (d)
Ni		2.16 (b)		1 (d)
Cu		49.6 (b)		29 (d)
Zn		106 (b)		3.7 (d)
Ga		3.92 (b)		8.3 (d)
Ge ppb				
As				
Se				
Rb		0.6 (b)	0.612 (c)	1 (d)
Sr		199 (b)	186 (c)	194 (d)
Y		134 (b)		160 (d)
Zr		256 (b)	263 (c)	362 (d)
Nb		27 (b)		
Mo		0.15 (b)		
Ru				
Rh				
Pd ppb				
Ag ppb				
Cd ppb				
In ppb				
Sn ppb				
Sb ppb		20 (b)		
Te ppb				
Cs ppm				
Ba		83 (b)	82.2 (c)	405 (d)
La		6.5 (b)	11.4 (c)	
Ce		25.5 (b)	22.8 (c)	
Pr		4.35 (b)		
Nd		25.9 (b)	25.3 (c)	
Sm		10.7 (b)	10.5 (c)	
Eu		1.95 (b)	2.1 (c)	
Gd		13.9 (b)	16.6 (c)	
Tb		2.82 (b)		
Dy		18.4 (b)	18.8 (c)	
Ho		3.95 (b)		
Er		11.1 (b)	11.1 (c)	
Tm		1.53 (b)		
Yb		11.1 (b)	9.85 (c)	13 (d)
Lu		1.42 (b)		
Hf		8.78 (b)		
Ta		1.79 (b)		
W ppb		80 (b)		
Re ppb				
Os ppb				
Ir ppb				
Pt ppb				
Au ppb				
Th ppm		0.36 (b)		
U ppm		0.1 (b)	0.126 (c)	

technique (a) XRF, (b) ICP-MS, (c) IDMS, (d) microchemical

Lunar Basalts

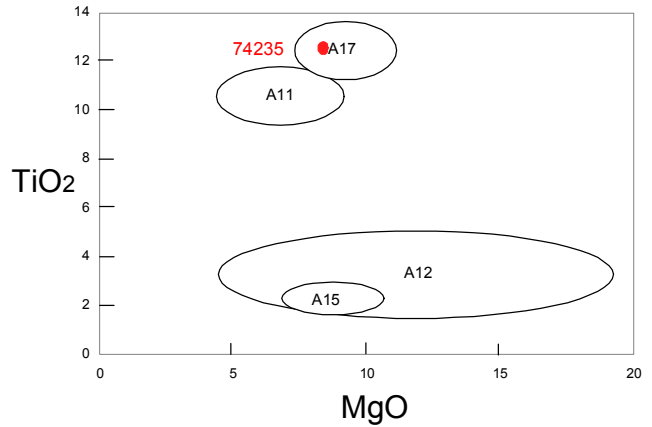


Figure 4: Composition of lunar basalts.

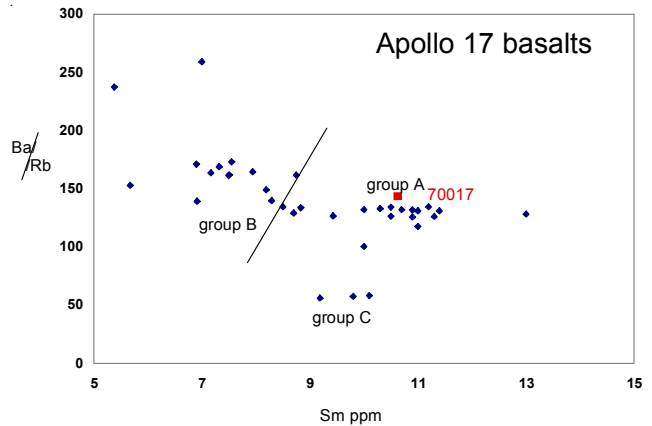


Figure 5: Trace element diagram for Apollo 17 basalts.

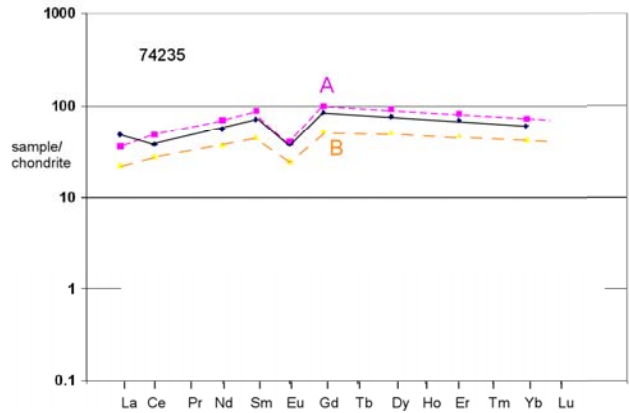


Figure 6: Normalized rare-earth-element diagram for 74235 compared with A and B types of Apollo 17 basalt.

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