

70075
Vitrophyric Basalt
5.64 grams

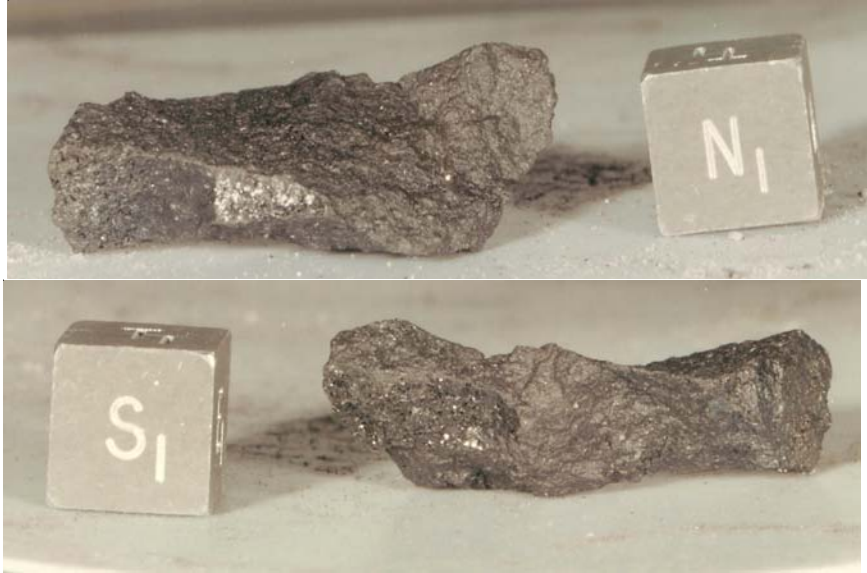


Figure 1: Photos of both sides of 70075. S73-21768 and 769. Cube is 1 cm.

Introduction

Although Butler (1973) and Neal and Taylor (1993) give a mineral mode for 70075, thin sections show that the sample is a vitrophyric basalt with only a few small phenocrysts of olivine and armalcolite armored with ilmenite.

70075 was collected near the LM.

Petrography

Warner et al. (1979) reported that the opaque “glass” matrix was actually fine-grained intergrowths of plagioclase, pyroxene and ilmenite (figure 2). Olivine composition is Fe_{70} .

Chemistry

Warner et al. (1979) determined the chemical composition of 70075 (table 1) and grouped it with type A Apollo 17 basalts (figure 4). The REE pattern indicates that it belongs to the type A basalts.

Processing

There are two thin sections of 70075.

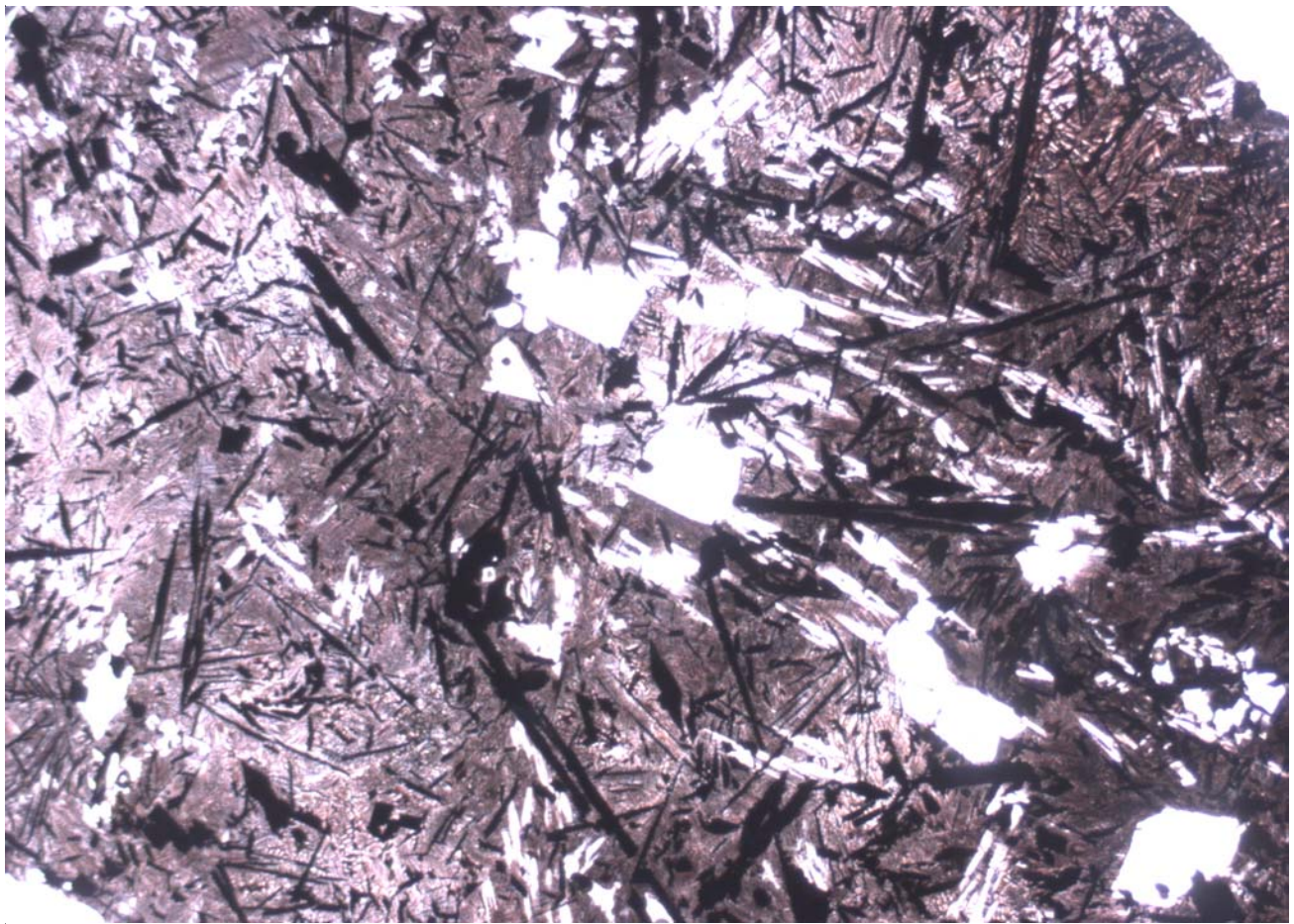


Figure 2: Photomicrographs of thin section 70075,4. 2.8 mm across



Table 1. Chemical composition of 70075.

reference	Ma77	
weight	Warner79	
SiO ₂ %		
TiO ₂	12.1	(a)
Al ₂ O ₃	9.3	(a)
FeO	19.4	(a)
MnO	0.253	(a)
MgO	8	(a)
CaO	10.3	(a)
Na ₂ O	0.417	(a)
K ₂ O	0.067	(a)
P ₂ O ₅		
S %		
sum		
Sc ppm	86	(a)
V	86	(a)
Cr	2800	(a)
Co	19	(a)
Ni		
Cu		
Zn		
Ga		
Ge ppb		
As		
Se		
Rb		
Sr		
Y		
Zr		
Nb		
Mo		
Ru		
Rh		
Pd ppb		
Ag ppb		
Cd ppb		
In ppb		
Sn ppb		
Sb ppb		
Te ppb		
Cs ppm		
Ba		
La	6.9	(a)
Ce	27	(a)
Pr		
Nd	28	(a)
Sm	10.9	(a)
Eu	2.21	(a)
Gd		
Tb	2.8	(a)
Dy	18	(a)
Ho		
Er		
Tm		
Yb	10.4	(a)
Lu	1.53	(a)
Hf	9	(a)
Ta	2.1	(a)
W ppb		
Re ppb		
Os ppb		
Ir ppb		
Pt ppb		
Au ppb		
Th ppm		
U ppm		
technique:	(a) INAA	

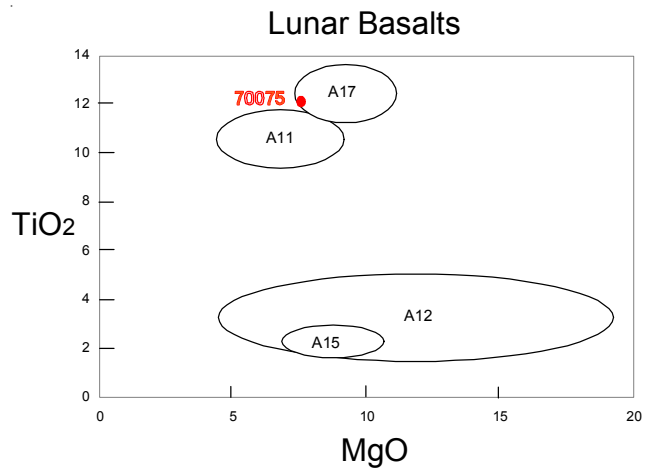


Figure 3: Composition of Apollo basalts.

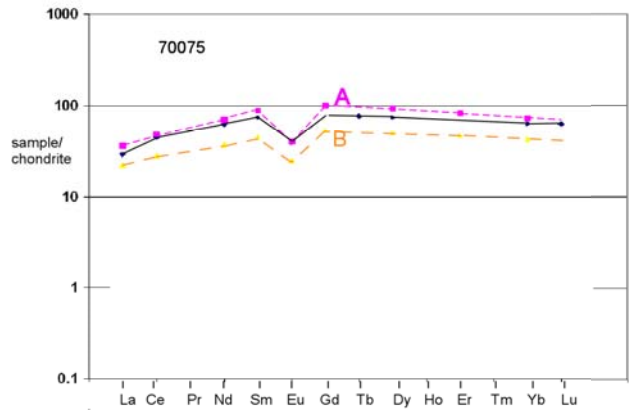
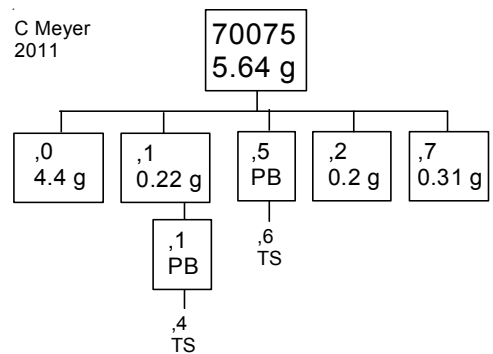


Figure 4: Normalized rare-earth-element diagram for 70075 and type A and B basalts.



References for 70075

Butler P. (1973) **Lunar Sample Information Catalog Apollo 17**. Lunar Receiving Laboratory. MSC 03211 Curator's Catalog. pp. 447.

LSPET (1973) Apollo 17 lunar samples: Chemical and petrographic description. *Science* **182**, 659-672.

LSPET (1973) Preliminary Examination of lunar samples. Apollo 17 Preliminary Science Rpt. NASA SP-330. 7-1 – 7-46.

Ma M.-S., Schmitt R.A., Warner R.D., Taylor G.J. and Keil K. (1979b) Composition, petrography, and genesis of Apollo 17 high-Ti mare basalts (abs). *Lunar Planet. Sci.* **X**, 765-767. Lunar Planetary Institute, Houston.

Muehlberger et al. (1973) Documentation and environment of the Apollo 17 samples: A preliminary report. *Astrogeology* 71 322 pp superceded by *Astrogeology* 73 (1975) and by Wolfe et al. (1981)

Muehlberger W.R. and many others (1973) Preliminary Geological Investigation of the Apollo 17 Landing Site. *In Apollo 17 Preliminary Science Report*. NASA SP-330.

Neal C.R. and Taylor L.A. (1993) Catalog of Apollo 17 rocks. Vol. 2 Basalts

Papike J.J., Hodges F.N., Bence A.E., Cameron M. and Rhodes J.M. (1976) Mare basalts: Crystal chemistry, mineralogy and petrology. *Rev. Geophys. Space Phys.* **14**, 475-540.

Warner R.D., Warren R.G., Mansker W.L., Berkley J.L. and Keil K. (1976a) Electron microprobe analyses of olivine, pyroxene and plagioclase from Apollo 17 rake sample mare basalts. Spec. Publ. # 15, UNM Institute of Meteoritics, Albuquerque. 158 pp.

Warner R.D., Nehru C.E. and Keil K. (1978g) Opaque oxide mineral crystallization in lunar high-titanium basalts. *Am. Mineral.* **63**, 1209-1224.

Warner R.D., Taylor G.J., Conrad G.H., Northrop H.R., Barker S., Keil K., Ma M.-S. and Schmitt R. (1979a) Apollo 17 high-Ti mare basalts: New bulk compositional data, magma types, and petrogenesis. *Proc. 10th Lunar Planet. Sci. Conf.* 225-247.

Wolfe E.W., Lucchitta B.K., Reed V.S., Ulrich G.E. and Sanchez A.G. (1975) Geology of the tarus-Littrow valley floor. *Proc. 6th Lunar Sci. Conf.* 2463-2482.

Wolfe E.W., Bailey N.G., Lucchitta B.K., Muehlberger W.R., Scott D.H., Sutton R.L and Wilshire H.G. (1981) The geologic investigation of the Taurus-Littrow Valley: Apollo 17 Landing Site. US Geol. Survey Prof. Paper, 1080, pp. 280.