70147

Ilmenite Basalt

1.35 grams

Figure 1: These are chips off of 70135, which is a boulder sampled at S73-17974. Cube is 1 cm.

Introduction

70147 is another chip off of Geophone Rock – see section on 70135. It is a high-Ti, plagioclase-poikilitic basalt with no olivine.

Geophone Rock is a basalt boulder located about 50 meters south of the ALSEP site.

Note: The weight listed for 70147 in Neal and Taylor (1993) is incorrect.

Petrography

70147 (and 70135) are coarse-grained plagioclase-poikilitic rock with blocky ilmenite (figure 2). The mineralogy is described in Neal and Taylor (1993).

Chemistry

Neal et al. (1990) reported the chemical composition (table 1). It is a high-Ti basalt (figure 3). The REE pattern is given in figure 4.

Processing

70147 is a basalt chip from the bag (10E) used to return 70135 and is most certainly a chip of same (Butler 1973). There is only one thin section.

Mineralogical Mode

	70135	Roedder	70139	70147
Olivine	2.8	3.8	2.5	- -
Pyroxene	46.2	51.6	35.8	48.2
Plagioclase	28.4	23	41.6	29.4
Opaques	21.9	19.6	18.2	21
Silica	0.3	0.6	1.9	0.2
Meostasis	0.4	1.4		

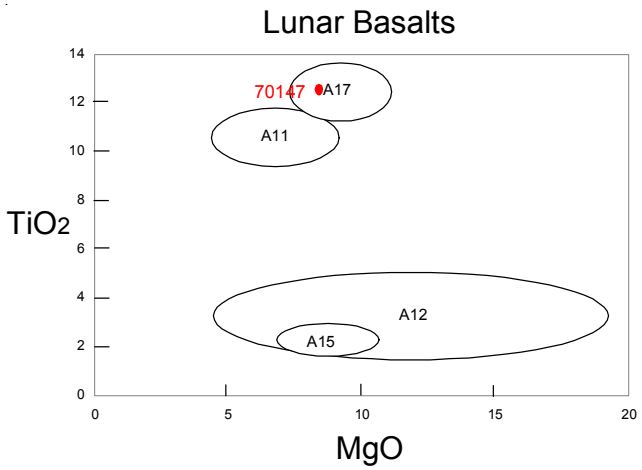


Figure 3: Composition of 70147 compared with that of Apollo basalts.

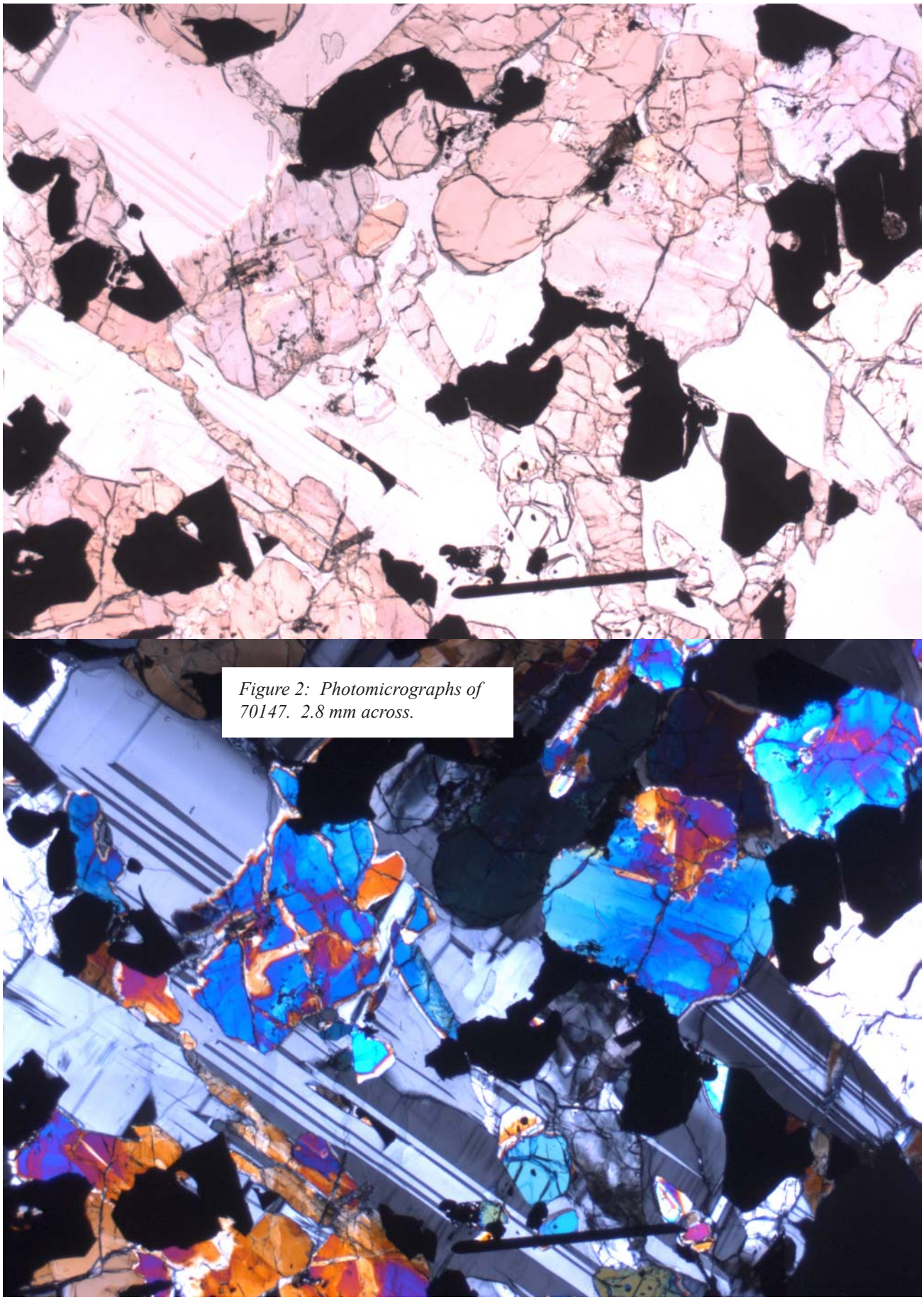


Figure 2: Photomicrographs of 70147. 2.8 mm across.

Table 1. Chemical composition of 71047.

reference	Neal90	
weight		
SiO2 %		
TiO2	13	(a)
Al2O3	8.4	(a)
FeO	17.9	(a)
MnO	0.23	(a)
MgO	8.8	(a)
CaO	9.2	(a)
Na2O	0.39	(a)
K2O	0.06	(a)
P2O5		
S %		
sum		
Sc ppm	77	(a)
V	131	(a)
Cr	3530	(a)
Co	22.8	(a)
Ni	6	(a)
Cu		
Zn		
Ga		
Ge ppb		
As		
Se		
Rb		
Sr	140	(a)
Y		
Zr	210	(a)
Nb		
Mo		
Ru		
Rh		
Pd ppb		
Ag ppb		
Cd ppb		
In ppb		
Sn ppb		
Sb ppb		
Te ppb		
Cs ppm	0.04	(a)
Ba	76	(a)
La	4.8	(a)
Ce	22	(a)
Pr		
Nd	18	(a)
Sm	7.1	(a)
Eu	1.7	(a)
Gd		
Tb	2.1	(a)
Dy	13.2	(a)
Ho		
Er		
Tm		
Yb	7.2	(a)
Lu	1.07	(a)
Hf	6.9	(a)
Ta	1.4	(a)
W ppb		
Re ppb		
Os ppb		
Ir ppb		
Pt ppb		
Au ppb		
Th ppm	0.2	(a)
U ppm	0.1	(a)

technique: (a) INAA

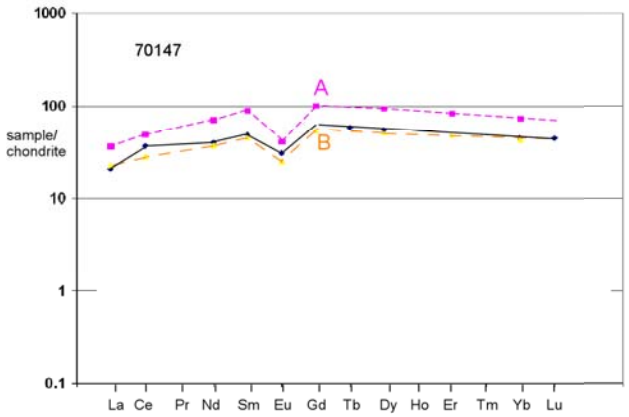
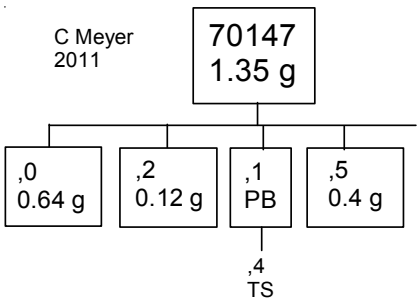


Figure 4: Normalized rare-earth-element diagram for 70147 and type A and B basalts.



References for 70147

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.

Muehlberger et al. (1973) Documentation and environment of the Apollo 17 samples: A preliminary report. Astrogeology 71 322 pp superceeded by Astrogeolgy 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

Neal C.R., Taylor L.A., Patchen A.D., Hughes S.S. and Schmitt R.A. (1990a) The significance of fractional crystallization in the petrogenesis of Apollo 17 Type A and B high-Ti basalts. *Geochim. Cosmochim. Acta* **54**, 1817-1833.

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.