

71579**High-Ti Mare Basalt****7.94 g****INTRODUCTION**

See "Rake Sample Descriptions" and "Table of Rake Samples", as well as Fig. 1.

PETROGRAPHY AND MINERAL CHEMISTRY

Warner et al. (1978) reported the petrography and mineral chemistry of 71579. During the preparation of this catalog, we examined thin section 71579,3 and found it to be a fine- to medium-grained (0.1-0.4mm) basalt (Fig. 2). It is dominated by "bow-tie" intergrowths of plagioclase and pyroxene. Pyroxene also occurs as blocky masses. Corroded olivine phenocrysts (0.7mm) with pyroxene rims are present

(Fig. 2). The olivines contain subhedral chromite inclusions (~0.005mm). Ilmenite phenocrysts (up to 1mm) contain "sawtooth" margins (Fig. 2) and also form a groundmass phase. Rutile and chromite exsolution is present in the ilmenites. Native Fe and troilite (<0.1mm) are disseminated throughout. Minor interstitial SiO₂ (~0.1mm) is associated with ilmenite.

WHOLE-ROCK CHEMISTRY

Murali et al. (1977) reported the whole-rock composition of 71579,1 in a study of Apollo 17 rake samples (Table 1). 71579 is classified as a Type 132 Apollo 17 high-Ti basalt, based on the classification of Rhodes et al. (1976) and Warner et al. (1979),

plus the criteria of Neal et al. (1990). This sample contains 12.1 wt% TiO₂, with a MG# of 39.7. The REE profile (Fig. 3) is LREE-depleted. However, Murali et al. (1977) reported 33 ppm Ce, but in parentheses - inclusion of Ce in the profile would give 71579 a positive Ce anomaly. We have not included Ce in Fig. 3, as the uncertainties associated with analyzing Ce by INA, coupled with the overall LREE-depleted nature of Apollo 17 high-Ti basalts, suggests that the 33 ppm Ce quoted by Murali et al. (1977) is probably a maximum. In reality, this value must be lower. The HREE are generally flat at 32-34 times chondritic levels. A negative Eu anomaly is present [(Eu/Eu*)_N = 0.57].



Figure 1: Hand specimen photograph of 71579,0. Small divisions on scale are in millimeters.

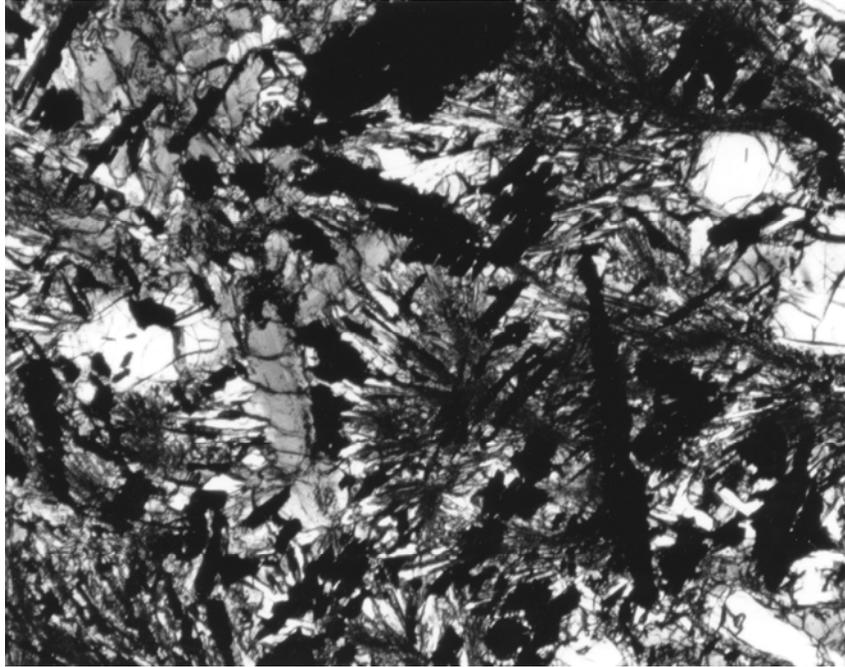


Figure 2: Photomicrograph of 71579,3. Ilmenite and olivine phenocrysts are set in a variolitic groundmass. Field of view = 2.5 mm.

PROCESSING

Of the original 7.948 of 71579,0, approximately 7.52g remains. 71579,1 was used for INAA and the thin section ,3 was taken from this irradiated sample.

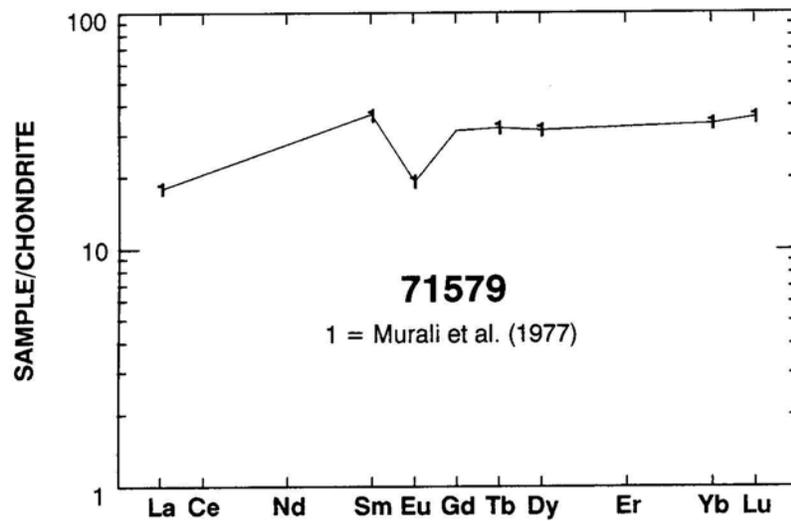


Figure 3: Chondrite -normalized rare-earth. element profile of 71579. Data from Murali et al. (1977).

Table 1: Whole-rock chemistry of 71579.
Data from Murali et al. (1977).

Sample 71579,1 Method N		Sample 71579,1 Method N	
SiO ₂ (wt %)		Cu	
TiO ₂	12.1	Ni	
Al ₂ O ₃	8.9	Co	20.1
Cr ₂ O ₃	0.358	V	88
FeO	20.6	Sc	82
MnO	0.245	La	6.0
MgO	7.6	Ce	(33)
CaO	9.3	Nd	
Na ₂ O	0.40	Sm	7.5
K ₂ O	0.053	Eu	1.50
P ₂ O ₅		Gd	
S		Tb	1.9
Nb (ppm)		Dy	11
Zr		Er	
Hf	7.1	Yb	7.5
Ta	1.5	Lu	1.23
U		Ga	
Th		F	
W		Cl	
Y		C	
Sr		N	
Rb		H	
Li		He	
Ba		Ge (ppb)	
Cs		Ir	
Be		Au	
Zn		Ru	
Pb		Os	

Analysis by: N = INAA.