

71586**High-Ti Mare Basalt****26.92 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 71586. During the preparation of this catalog, we examined thin section 71586,4 and found it to be a fine- to medium-grained (0.1-0.35mm) basalt, 71586 is comprised of plagioclase-pyroxene "bow-tie" intergrowths (Fig. 2). It contains olivine microphenocrysts (up to 0.6mm - Fig. 2) all of which exhibit resorption features and minor pink pyroxene overgrowths. The olivines contain euhedral chromite inclusions (~0.005mm). Ilmenite phenocrysts reach up to 1.5mm and overlay the plagioclase-pyroxene groundmass, but not the olivine phenocrysts (Fig. 2). These ilmenite phenocrysts have "sawtooth" margins. Ilmenite also forms a minor groundmass phase. Both groundmass and phenocryst ilmenite contain minor rutile and chromite exsolution. No armalcolite was observed.

WHOLE-ROCK CHEMISTRY

Murali et al. (1977) reported the whole-rock composition of 71586,1 in a study of Apollo 17 rake samples (Table 1). Based on the classification of Rhodes et al. (1976) and Warner et al. (1979), as well as the criteria of Neal et al. (1990), 71586 is classified as a Type B2 Apollo17 high-Ti basalt. This sample contains 10.5 wt% TiO₂ with a MG# of 42.9. The REE profile (Fig. 3) is LREE-depleted, but Ce has not been included. Murali et al. (1977) reported 38 ppm Ce, but in parentheses, and inclusion of it in this profile would produce a positive Ce anomaly. The high uncertainty-ties associated with analyzing

Ce by INA, coupled with the overall LREE-depleted nature of Apollo 17 high-Ti basalts, suggests that the 38 ppm Ce quoted by Murali et al. (1977) is probably spurious. In reality, this value is probably lower. The HREE are flat at approximately 33 times chondritic abundances (Fig. 3). A negative Eu anomaly is present [(Eu/Eu*)_N = 0.56].

PROCESSING

Of the original 26.928 of 71586, 0, a total of 26.53g remains. 71586, 1 was used for INAA, and thin section, 4 was taken from this irradiated sample.

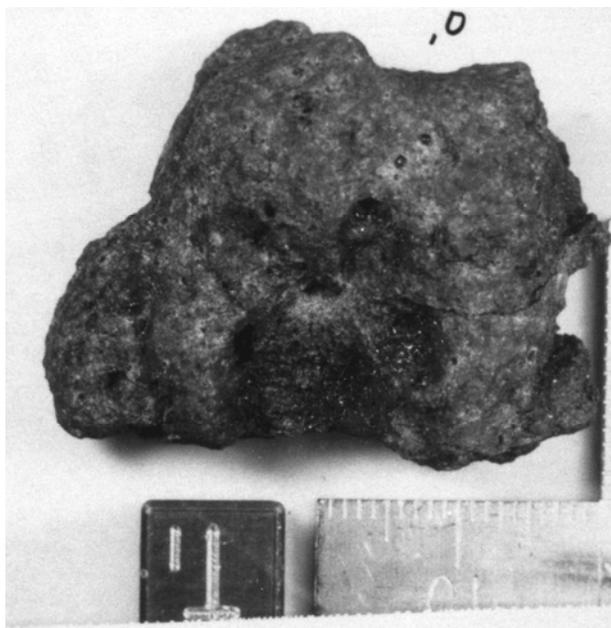


Figure 1: Hand specimen photograph of 71586,0. Small divisions on scale are in millimeters.



Figure 2: Photomicrographs of 71586,4. Olivine microphenocrysts have a reaction rim of pyroxene. Ilmenite phenocrysts have sawtooth margins. These are set in a variolitic groundmass. Field of view is 2.5 mm.

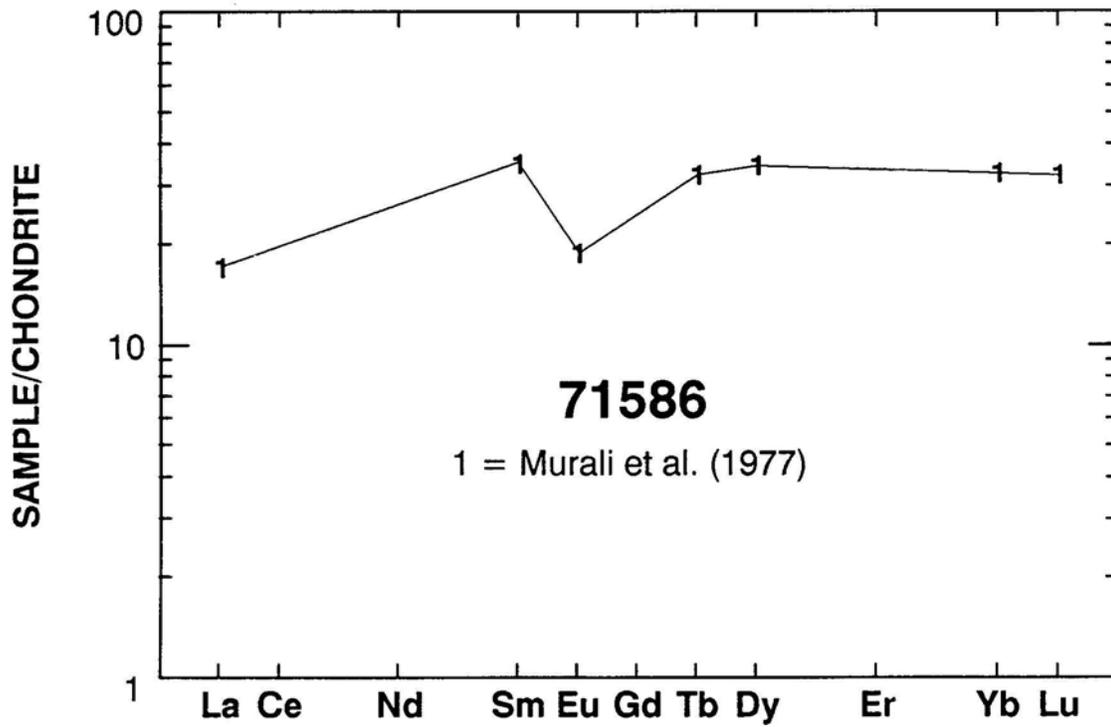


Figure 3: Chondrite -normalized rare-earth element profile of 71586. Data from Murali et al. (1977).

Table 1: Whole-rock chemistry of 71586.
Data from Murali et al. (1977).

Sample 71586,1 Method N		Sample 71586,1 Method N	
SiO ₂ (wt %)		Cu	
TiO ₂	10.5	Ni	
Al ₂ O ₃	9.2	Co	22.3
Cr ₂ O ₃	0.486	V	131
FeO	19.7	Sc	75
MnO	0.248	La	5.7
MgO	8.3	Ce	(38)
CaO	9.3	Nd	
Na ₂ O	0.33	Sm	7.2
K ₂ O	0.044	Eu	1.47
P ₂ O ₅		Gd	
S		Tb	1.9
Nb (ppm)		Dy	12
Zr		Er	
Hf	7.0	Yb	7.3
Ta	1.3	Lu	1.11
U		Ga	
Th		F	
W		Cl	
Y		C	
Sr		N	
Rb		H	
Li		He	
Ba		Ge (ppb)	
Cs		Ir	
Be		Au	
Zn		Eu	
Pb		Os	

Analysis by: N = INAA.