

71087**High-Ti Mare Basalt****2.20 g, 1.5 x 1.5 x 1 cm****INTRODUCTION**

71087 (Fig. 1) was described as a fine-grained, equigranular, medium dark gray (with brownish tint), homogeneous basalt (Apollo 17 Lunar Sample Information Catalog, 1973). It contains only one cavity lined with ilmenite crystals and is covered with a thick dust coating. One surface is probably a broken cavity lined with ilmenite crystals. This basalt was collected from Station 1A.

PETROGRAPHY AND MINERAL CHEMISTRY

Neal et al. (1990) described 71087 as a fine-grained, sub-variolitic, olivine porphyritic basalt. Olivine (up to 0.7mm)

and ilmenite (up to 1.2mm) phenocrysts are present, with olivine containing overgrowths of pyroxene and ilmenite "sawtooth" margins. Rutile and chromite exsolution lamellae (< 0.005mm) are present in ilmenite.

Plagioclase, pyroxene, and ilmenite form groundmass phases (~ 0.2-0.4mm). Cr-ulvospinel (~0.1mm) occurs as inclusions in pyroxene and olivine. Silica, native Fe, and troilite form interstitial phases. Point counting reveals that this sample is comprised of 48.1% pyroxene; 24.4% plagioclase; 21.2% ilmenite; 3.1% native Fe and troilite; 0.2% olivine; 1% silica; and 2% spinel.

Olivine exhibits only minor core-to-rim zonation (5 mole %

Fo, max.), but between grains the compositional variation is more pronounced (Fo₅₈₋₇₁). Plagioclase exhibits only minor variations either core-to-rim or between grains (An₈₁₋₈₇). Pyroxene compositions (Fig. 2) range from titan-augite to pigeonite (with compositional intermediates). Fe enrichment is noted towards the rims. Al/Ti ratios are constant at ~2 and Cr₂O₃ decreases with decreasing pyroxene MG#. Cr-ulvospinel (Cr/(Cr+Al) = 65-76; MG# = 4-18) and ilmenite (MG# = 2-12) both exhibit moderate compositional variations. Cr-ulvospinel becomes more Al- and Fe-rich from core-to-rim, but ilmenite variation is primarily between grains. No armalcolite is present.



Figure 1: Hand specimen photograph of 71087,0.

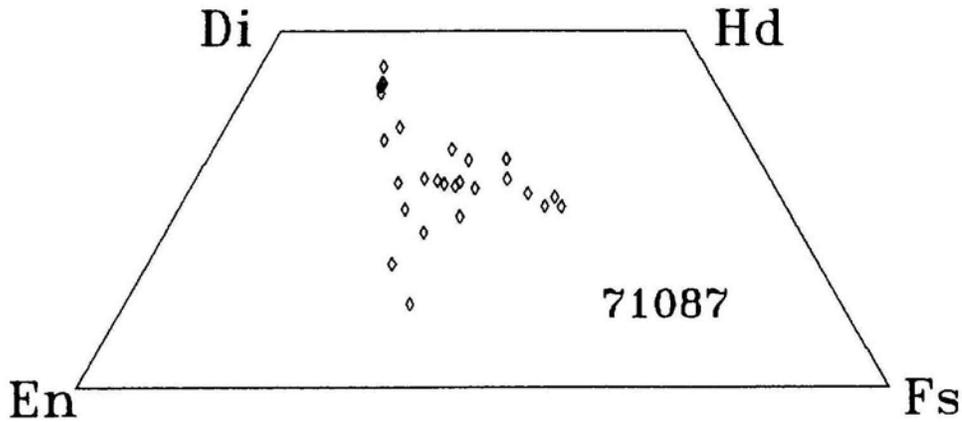


Figure 2: Pyroxene compositions of 71087 represented on a pyroxene quadrilateral.

WHOLE-ROCK CHEMISTRY

Neal et al. (1990) reported the whole-rock chemistry of 71087 (Table 1). They described 71087 as a Type A Apollo 17 high-Ti basalt (using the classification of Rhodes et al., 1976 and Warner et al., 1979) containing 12.9 wt% TiO₂ with a MG# of 43.1. The REE profile (Fig. 3) is

LREE-depleted, but with an overall slight convex-upward appearance. A negative Eu anomaly is present ([Eu/Eu*]_N = 0.54).

71087,5 was used for INAA, and thin section 71087,4 was pre-pared from the irradiated sample.

PROCESSING

Of the original 2.20g of 71087,0, a total of 1.63g remains.

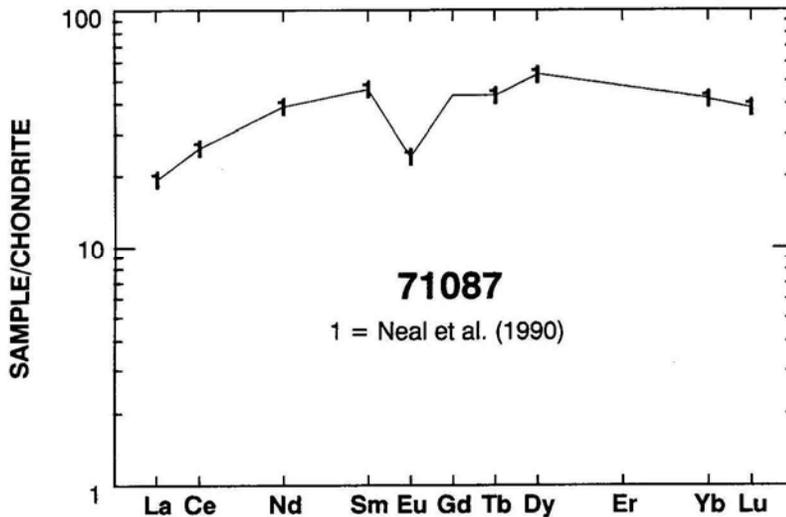


Figure 3: Chondrite -normalized rare-earth element profile of 71087.

Table 1: Whole-rock chemistry of 71087.
Data from Neal et al. (1990).

	71087,5 I		71087,5 I
SiO ₂ (wt %)		Cu	
TiO ₂	12.9	Ni	31
Al ₂ O ₃	8.10	Co	19
Cr ₂ O ₃	0.212	V	104
FeO	18.8	Sc	80
MnO	0.250	La	6.48
MgO	7.9	Ce	23
CaO	10.2	Nd	25
Na ₂ O	0.39	Sm	9.53
K ₂ O	0.08	Eu	1.89
P ₂ O ₅		Gd	
S		Tb	2.56
Nb (ppm)		Dy	18.6
Zr	101	Er	
Hf	8.61	Yb	9.40
Ta	1.89	Lu	1.33
U		Ga	
Th	0.49	F	
W		Cl	
Y		C	
Sr	204	N	
Rb		H	
Li		He	
Ba	89	Ge (ppb)	
Cs	0.24	Ir	
Be		Au	
Zn		Ru	
Pb		Os	

I = analysis by INAA.