

71088**High-Ti Mare Basalt
2.064 g, 2 x 1 x 0.5 cm****INTRODUCTION**

71088 (Fig. 1) was described as a fine-grained, equigranular, medium dark gray basalt (Apollo 17 Lunar Sample Information Catalog, 1973). This basalt contains three small (1 mm) vugs lined with ilmenite. It is thinly coated with dust and white patches are present on one surface. This sample was collected from Station 1A.

**PETROGRAPHY AND
MINERAL CHEMISTRY**

Neal et al. (1990) described 71088 as a fine-grained

(0.2-0.4mm), subvariolytic, olivine porphyritic basalt. Olivine (up to 0.6mm) and ilmenite (up to 0.9mm) form microphenocryst phases. Olivines contain pink pyroxene over-growths which are occasionally extensive such that olivine forms a small core. Ilmenites exhibit "sawtooth" margins, but little rutile or chromite exsolution. Cr-ulvospinel is present as ~0.1mm inclusions in pyroxene and olivine. No armalcolite is present. Silica, native Fe, and troilite form interstitial phases. Point counting reveals that 71088 is comprised of: 36.8% pyroxene; 28.0% plagioclase; 21.7% ilmenite;

8.2% olivine; 2.3% native Fe and troilite; 2.1% spinel; and 0.9% silica.

Olivines exhibit wide compositional variations (F_{043-71}), usually between grains, but also from core-to-rim in the largest olivines. However, plagioclase exhibits only limited variation (An_{80-88}). The majority of pyroxenes are titan-augites (Fig. 2), although rare pigeonites are present. Fe enrichment is observed from core-to-rim. Al/Ti ratios are constant at ~2 and Cr_2O_3 decreases with decreasing MG#. Cr-ulvospinels exhibit limited compositional variation ($Cr/(Cr+Al) = 72-77$;

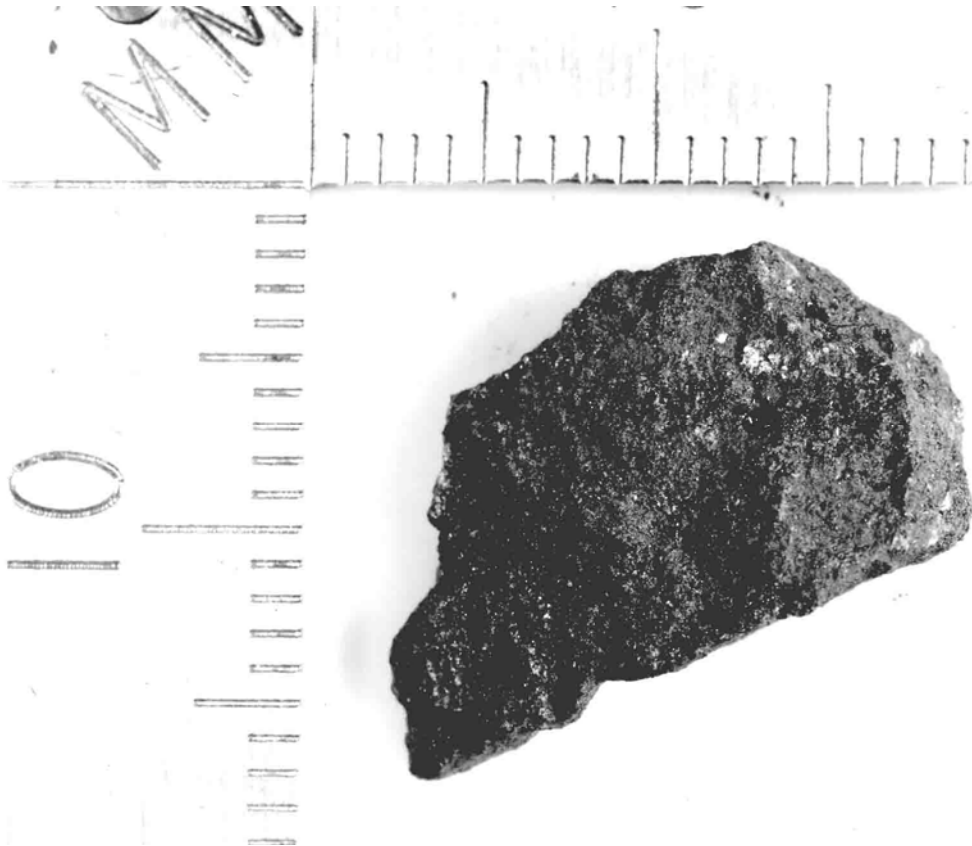


Figure 1: Hand specimen photograph of 71088,0.

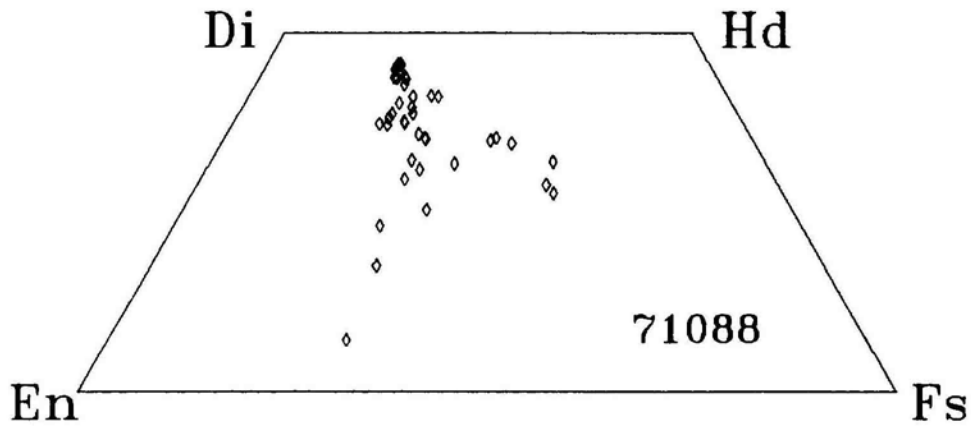


Figure 2: Pyroxene compositions of 71088 represented on a pyroxene quadrilateral.

MG# 7-8), whereas ilmenite exhibits greater variation, mostly between individual grains (MG# = 7-18).

WHOLE-ROCK CHEMISTRY

Neal et al_ (1990) described 71088 as a Type A Apollo 17

high-Ti mare basalt (using the classification of Rhodes et al., 1976 and Warner et al., 1979). 71088 contains 12.5 wt% TiO₂ with a MG# of 43.4 (Table 1). The REE profile (Fig. 3) is LREE-depleted with a general convex-upward appearance. A negative Eu anomaly is present ([Eu/Eu*] N = 0.52).

PROCESSING

Of the original 2.0648 of 71088,0, a total of 1.72g remains. 71088,5 was used for INAA, and thin section 71088,4 was prepared from the irradiated sample.

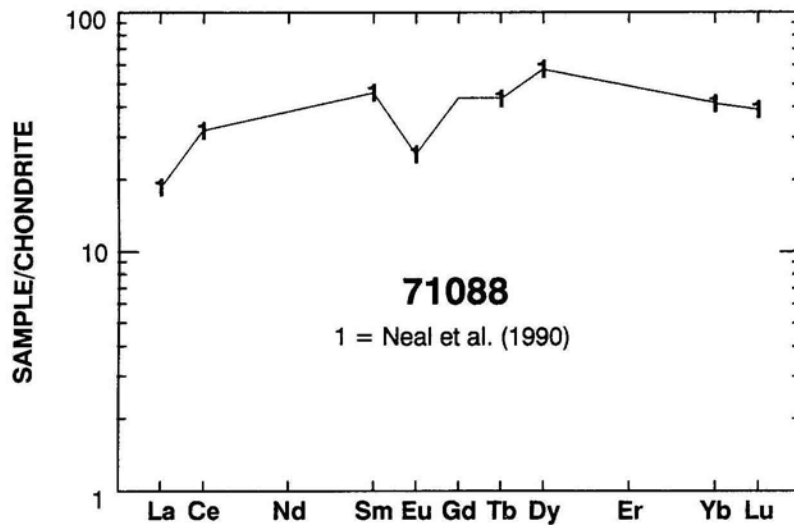


Figure 3: Chondrite-normalized rare-earth element profile of 71088.

Table 1: Whole-rock chemistry of 71088.
Data from Neal et al. (1990).

	71088,5 I		71088,5 I
SiO ₂ (wt %)		Cu	
TiO ₂	12.5	Ni	32
Al ₂ O ₃	8.60	Co	20
Cr ₂ O ₃	0.208	V	108
FeO	18.5	Sc	79
MnO	0.260	La	6.19
MgO	8.3	Ce	28
CaO	10.3	Nd	38
Na ₂ O	0.39	Sm	9.43
K ₂ O	0.06	Eu	1.99
P ₂ O ₅		Gd	
S		Tb	2.55
Nb (ppm)		Dy	20.0
Zr	212	Er	
Hf	8.73	Yb	9.19
Ta	1.87	Lu	1.34
U		Ga	
Th	0.37	F	
W		Cl	
Y		C	
Sr	71	N	
Rb		H	
Li		He	
Ba	148	Ge (ppb)	
Cs	0.19	Ir	
Be		Au	
Zn		Ru	
Pb		Os	

I = analysis by INAA.