75087

High-Ti Mare Basalt
2.321 g, 2 x 2 x 1 cm

INTRODUCTION

75087 was described as a gray, homogeneous, angular basalt, containing six, non-penetrative fractures (Apollo 17 Lunar Sample Information Catalog, 1973). It has an equigranular fabric with 30% of the surface covered with glass and welded dirt (Fig. 1) and 20% taken up by interconnecting vugs. No zap pits were identified.

PETROGRAPHY AND MINERAL CHEMISTRY

75087 is a subophitic basalt which is plagioclase-poikilitic in places. It is medium- to coarse-grained and composed of anhedral plagioclase (0.1-1.4 mm), yellow to colorless anhedral pyroxene (0.1-1.4 mm), and anhedral ilmenite (0.04-0.8 mm). Ilmenite tends to concentrate around pyroxene, although there are ilmenite inclusions (up to 0.2 mm) in both pyroxene and plagioclase. Spinel and rutile exsolution lamellae are present in the ilmenite. Olivine is present as cores (0.05-0.1 mm) to the larger pyroxenes. Silica (up to 0.4 mm), troilite (< 0.01 mm), and FeNi metal (< 0.01 mm) form anhedral interstitial phases. Troilite occasionally contains blebs of FeNi metal. The modal data for 75087,3 were reported by Neal et al. (1989) as: 0.4% olivine, 48.9% pyroxene, 19.8% plagioclase, 21.0% ilmenite, 6.6% FeNi metal & troilite, and 3.3% silica.

The mineral chemistry for 75087 has also been reported by Neal et al. (1989). Olivine exhibits a large range of compositions (Fo_{37-65}), which is accounted for by both inter- and intra-grain variations. Almost all of the variation in plagioclase composition (An_{88-76}: Fig. 2) can be accounted for by coreto-rim zonation. Pyroxene compositions range from augite to pigeonite, with some Fe-enrichment (Fig. 3). Most of this variation is accounted for by core-to-rim zonation. The MG# of ilmenite varies primarily between grains.

WHOLE-ROCK CHEMISTRY

The whole-rock chemistry of 75087 was reported by Neal et al. (1990), who described it as a Type A Apollo 17 high-Ti mare basalt. This basalt contains 13.4 wt% TiO_2 (Table 1), with a MG# 46.8. The REE profile (Fig. 4) is

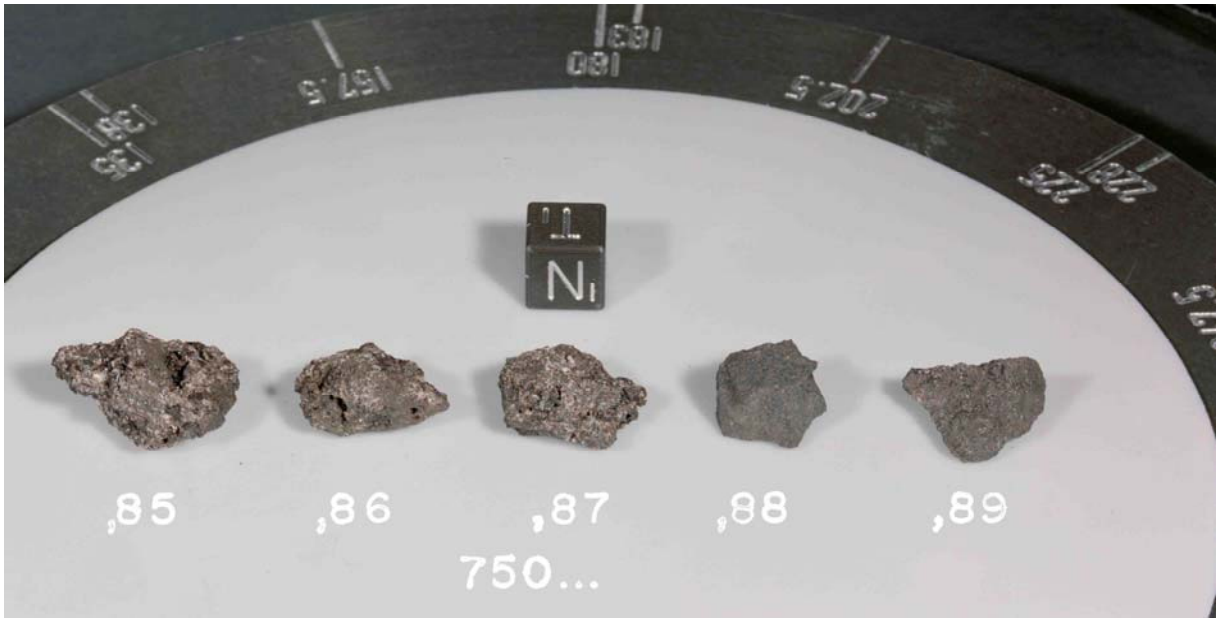

Figure 1: Hand specimen photograph of 75087,0.

LREE-depleted with a maximum in the middle REE (relative to chondrites). The negative Eu anomaly has a magnitude of $(Eu/Eu^*)_N = 0.53$.

PROCESSING

Of the original 2.321g of 75087,0, approximately 1.8g remains; 0.55g was used for analysis by INA, and 0.018 was used to make thin section ,3.

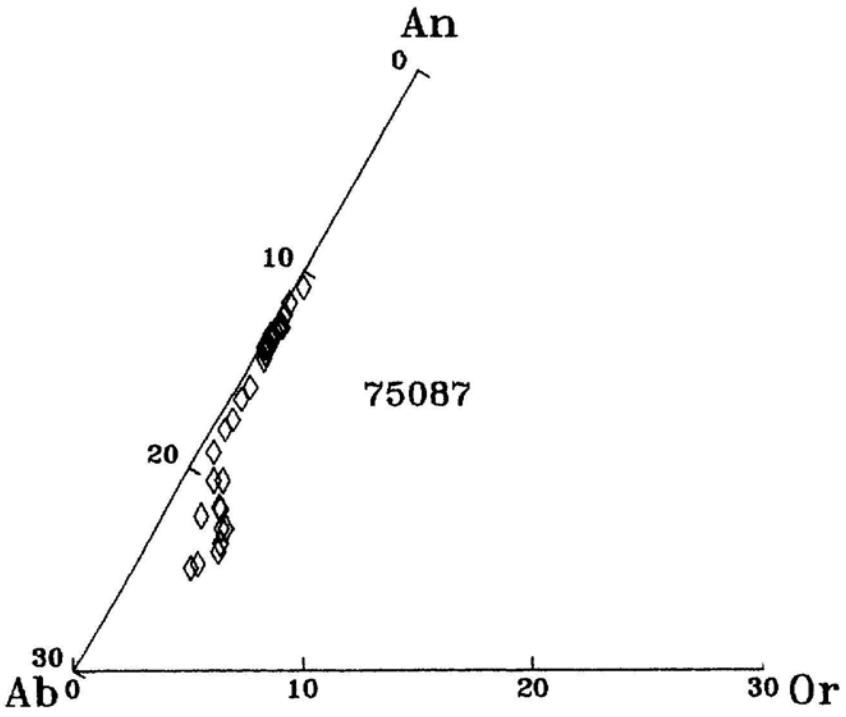

Figure 2: Plagioclase compositions from 75087.

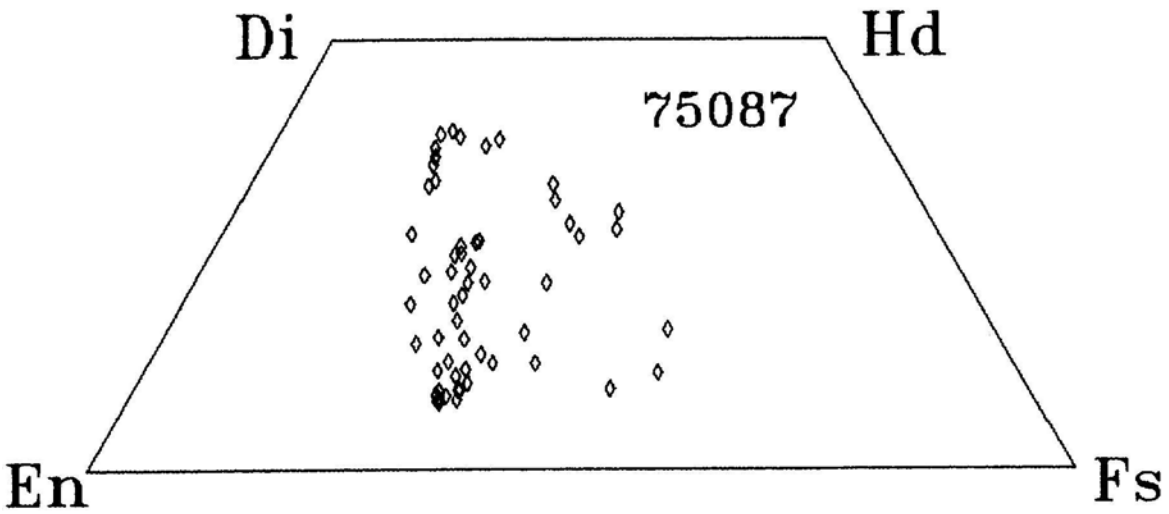

Figure 3: Pyroxene compositions of 75087 represented on a pyroxene quadrilateral.

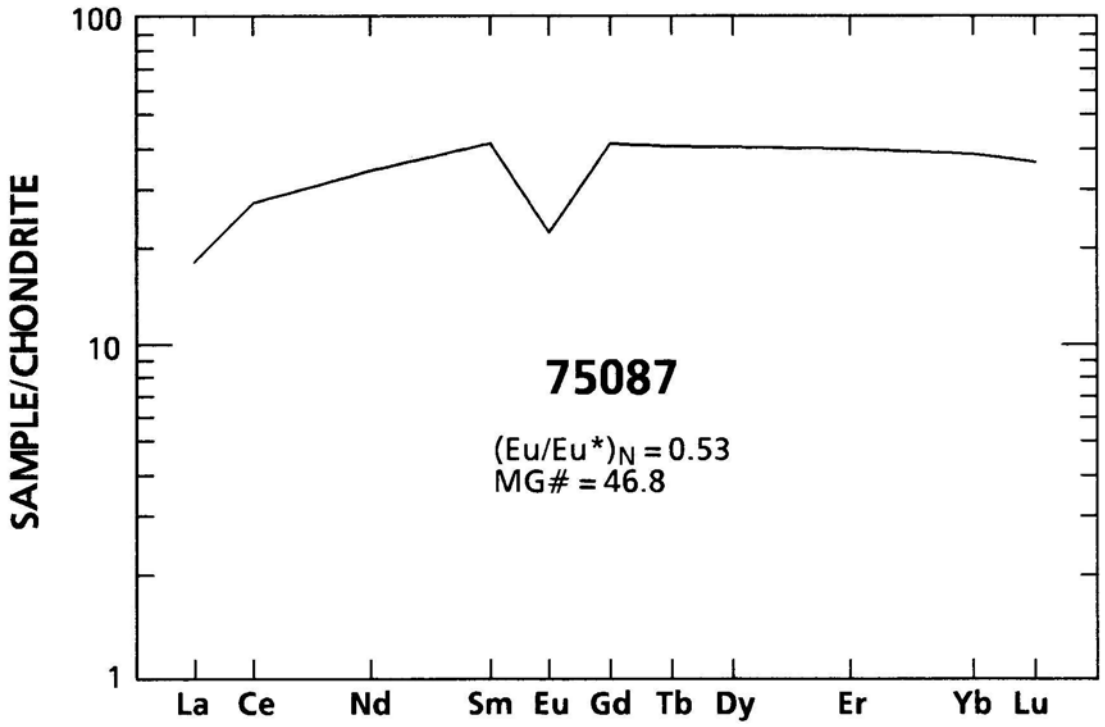

Figure 4: Chondrite -normalized rare-earth-element profile of 75087, after Neal et al. (1990).

Table 1: Whole-rock chemistry of 75087.
Data from Neal et al. (1990).

	Sample 75087,4 Method N		Sample 75087,4 Method N
SiO_2		Ni	12
TiO_2	13.4	Co	20.3
Al_2O_3	7.37	V	154
Cr_2O_3	0.547	Sc	86.9
FeO	19.0	Cr	3740
MnO	0.254	La	5.76
MgO	9.4	Ce	24
CaO	9.8	Nd	22
Na_2O	0.34	Sm	8.78
K_2O	0.05	Eu	1.74
P_2O_5		Gd	
S		Tb	2.37
Nb (ppm)		Dy	17.1
Zr	240	Er	
Hf	8.13	Yb	8.75
Ta	1.61	Lu	1.25
U	0.19	Ga	
Th	0.14	F	
W		Cl	
Y		C	
Sr	80	N	
Rb		H	
Li		He	
Ba	91	Ge (ppb)	
Cs	0.11	Ir	
Be		Au	
Zn		Ru	
Pb		Os	
Cu			

Analysis by: N = INAA.