

70147

Clast-Rich Impact Melt
379.2 g, 18 x 14 x 10 cm

INTRODUCTION

70147 (see Fig. 1 of 70146) was described as medium gray, sub-angular, high-Ti mare basalt which contains no cavities. All surfaces apart from E are fractures. No zap pits are present. This sample was collected from the "Geophone Rock", 50 m from the ALSEP central station.

PETROGRAPHY AND MINERAL CHEMISTRY

Neal et al. (1989) described 70147 as a plagioclase-poikilitic basalt, containing no olivine. Anhedral and blocky ilmenite (0.1-0.8 mm) forms an intersertal texture with plagioclase (0.3-2.7 mm) and pyroxene (0.1-2.8 mm). Ilmenite contains chromite and rutile exsolution lamellae (<0.005 mm). Rare discrete chromite-ulvospinel grains (~0.1 mm) are present, usually included in pyroxene. Armalcolite (~0.1 mm) without ilmenite rims is present as

inclusions in pyroxene. Native Fe, minor silica, and troilite form interstitial phases. Point counting revealed that this sample is comprised of: 48.2% pyroxene; 29.4% plagioclase; 16.7% ilmenite; 4.5% native Fe and troilite; 0.5% armalcolite; 0.5% chromite-ulvospinel; and 0.2% silica.

Plagioclase exhibits moderate core-to-rim variation (An_{76-90}), with the rims being more sodic. Pyroxene compositions range from pigeonite to titan-augite, with both variants zoning to a common, more Fe-rich composition (Fig. 1). Al/Ti ratios are constant at ~2, and Cr_2O_3 decreases with decreasing pyroxene MG#. The chromite-ulvospinel grains exhibit little core-to-rim variation [$(Cr/(Cr+Al)) = 64-69$; $MG\# = 20-24$]. However, armalcolite exhibits wide variations between grains ($MG\# = 39-48$), greater than that in ilmenite ($MG\# = 6-13$).

WHOLE-ROCK CHEMISTRY

Neal et al. (1990) described 70147, 0 as a Type A high-Ti basalt, using the classification of Rhodes et al. (1976) and Warner et al. (1979) (Table 1). This sample possesses a convex-upward REE profile, with the MREE contents reaching ~40 times chondritic values (Fig. 2). A negative Eu anomaly is present ($[Eu/Eu^*]_N = 0.59$). Neal et al. (1990) have used the whole-rock composition of 70147, 0 to refine previous petrogenetic models and formulate a new one for the Type A Apollo 17 high-Ti basalts.

PROCESSING

Approximately 0.7 g of 70147,0 remains; 0.64 g was irradiated for INAA, and 0.01 g was used for thin section 70147,4.

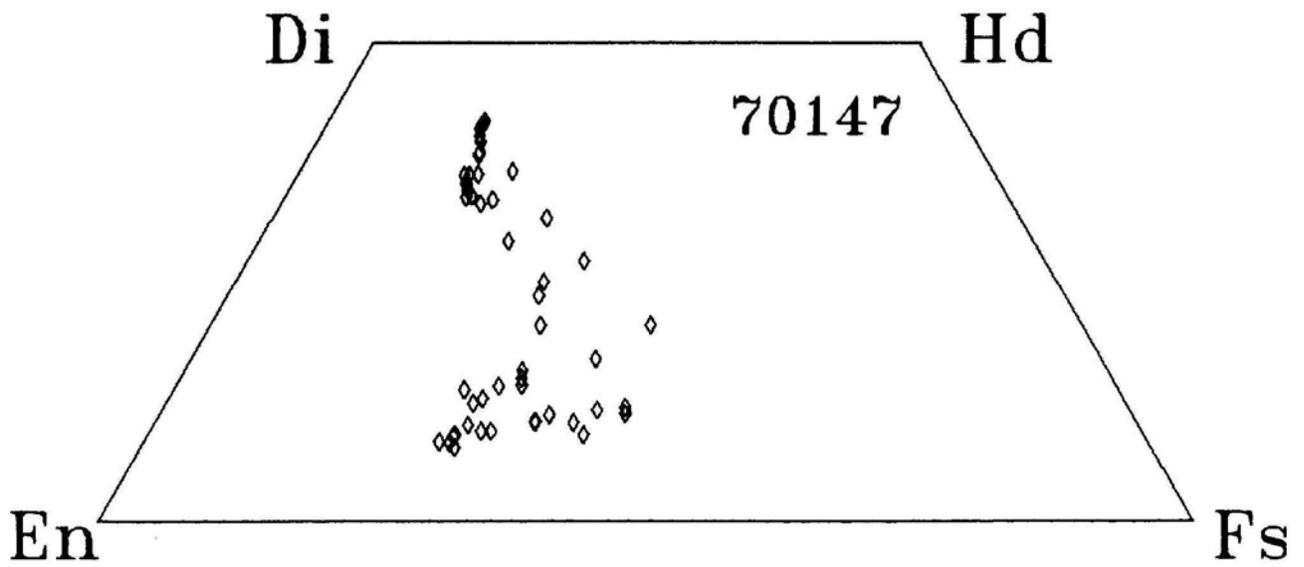


Figure 1: Pyroxene compositions of 70147 represented on a pyroxene quadrilateral.

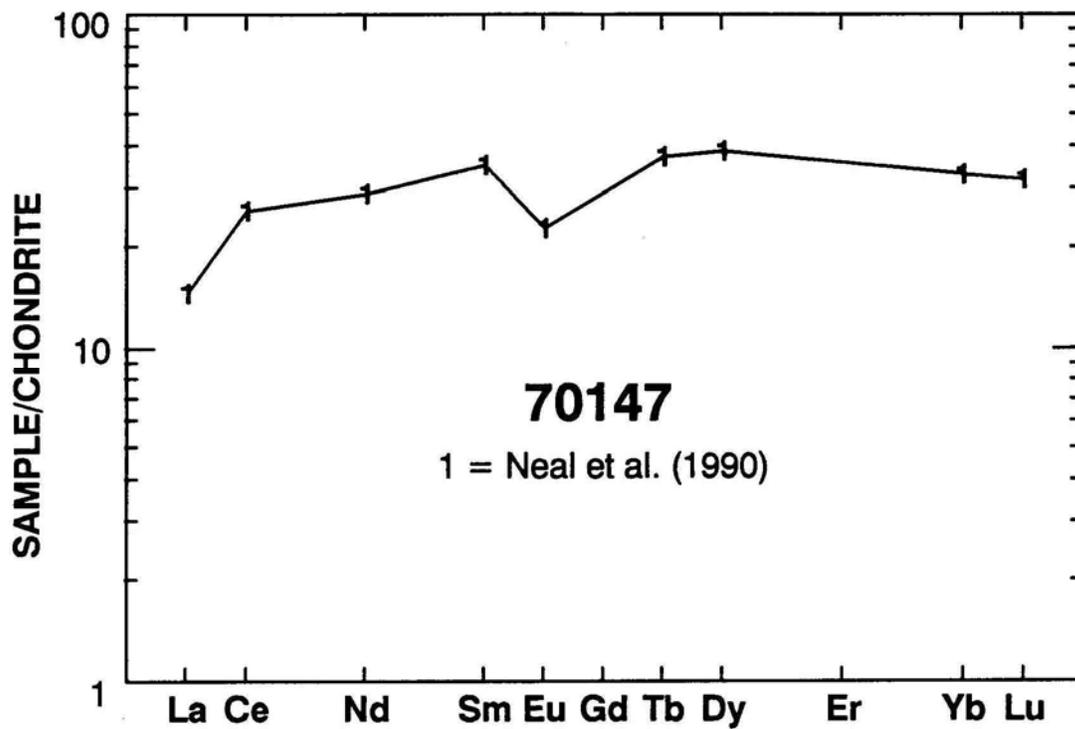


Figure 2: Chondrite -normalized rare-earth element profile of 70147.

Table 1: Whole-rock composition of 70147,0.
Data from Neal et al. (1990).

	70147,0		70147,0
SiO ₂ (wt%)		Cu	
TiO ₂	13.0	Ni	6
Al ₂ O ₃	8.38	Co	22.8
Cr ₂ O ₃	0.516	V	131
FeO	17.9	Sc	77
MnO	0.231	La	4.75
MgO	8.8	Ce	22
CaO	9.2	Nd	18
Na ₂ O	0.39	Sm	7.09
K ₂ O	0.06	Eu	1.74
P ₂ O ₅		Gd	
S		Tb	2.14
Nb (ppm)		Dy	13.2
Zr	210	Er	
Hf	6.87	Yb	7.19
Ta	1.43	Lu	1.07
U	0.06	Ga	
Th	0.15	F	
W		Cl	
Y		C	
Sr	140	N	
Rb		H	
Li		He	
Ba	76	Ge (ppb)	
Cs	0.04	Ir	
Be		Au	
Zn		Ru	
Pb		Os	

Analysis by INAA.