

78597**High-Ti Mare Basalt****319.1 g, 6.7 x 5.7 x 5.0 cm****INTRODUCTION**

Sample 78597 is a dark grey, medium-grained mare basalt from the large rake sample at Station 8 (Fig. 1).

PETROGRAPHY

This basalt has a porphyritic texture with relatively large olivine phenocrysts. The groundmass has a variolitic texture with intergrown pyroxene and plagioclase needles in radial clusters (Fig. 2). The plagioclase laths have a well-developed intrafasciculate texture.

Sample 78597 has a network of interconnecting vugs.

MINERAL CHEMISTRY

Warner et al. (1978f) have determined the chemical compositions of the minerals in 78597 (Fig. 3).

WHOLE-ROCK CHEMISTRY

Laul et al. (1975b) and Warner et al. (1975b) have reported the chemical composition of 78597 (Table 1). Rhodes et al. (1976a) have also reported the chemical composition of 78597 (Fig. 4). Please note that the isotope dilution mass spectroscopy data give a superior view of the true shape of the rare earth element pattern of these Apollo 17 basalts, as compared with the poorly defined

instrumental neutron activation analysis data.

Gibson et al. (1976) determined the sulfur content.

RADIOGENIC ISOTOPES

Nyquist et al. (1976) have reported Rb-Sr data for the whole rock (Table 2).

O'Kelley et al. (1974a) used the induced radioactivity of 78597 to study the solar flare of August 1972 (Table 3).



Figure 1: Photograph of 78597. Scale is 1 cm. S73-21424.

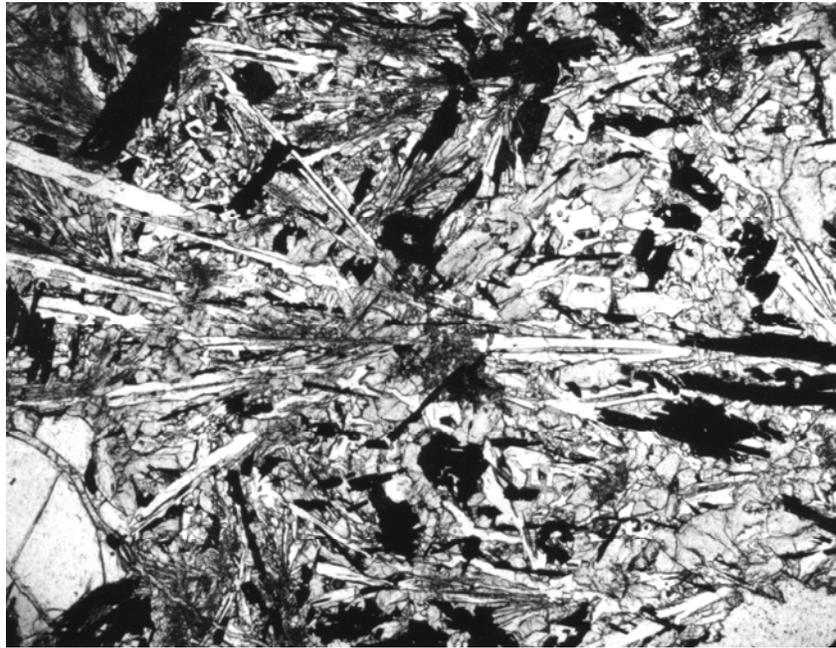


Figure 2: Photomicrograph of thin section 78597,11. Note the hollow plagioclase laths. Field of view is 3 x 4 mm.

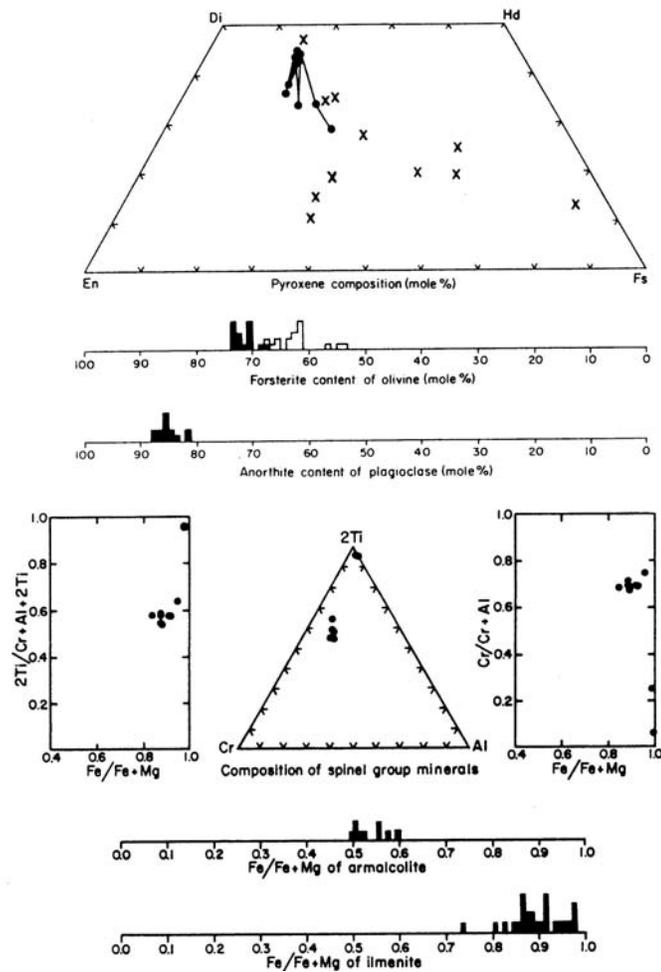


Figure 3: Mineral compositions for 78597. From Warner et al. (1978f).

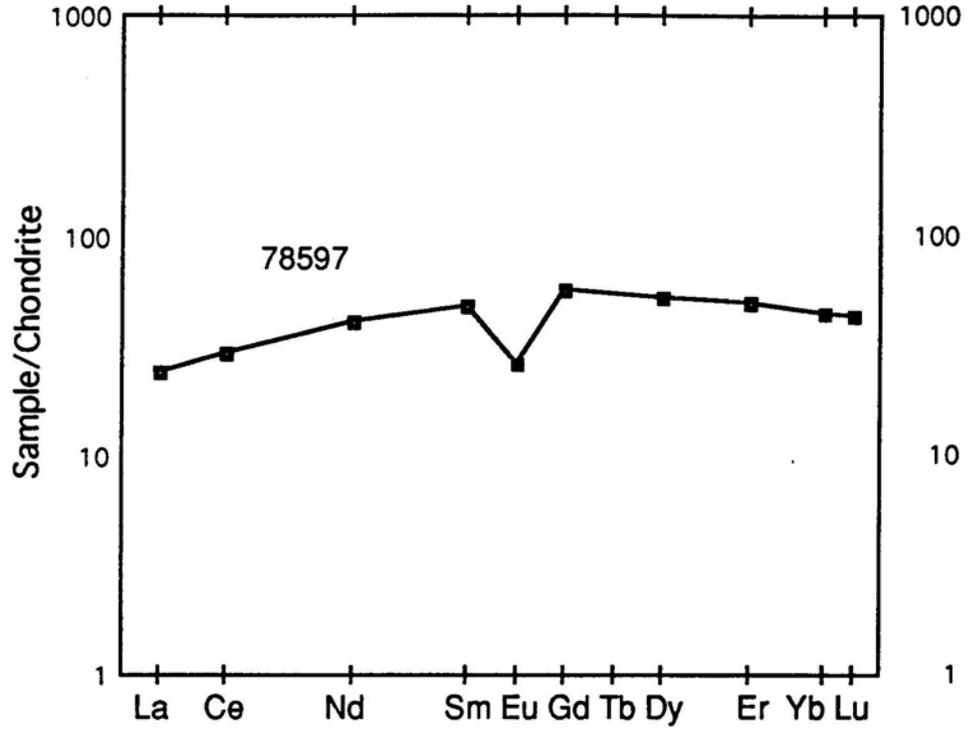


Figure 4: Normalized rare earth element diagram of 78597. Data from Rhodes et al. (1976a).

Table 1: Whole-rock chemistry of 78597.
a) Warner et al. (1975b); b) Rhodes et al. (1976a)

Split Technique	,1 (a) INAA	,4 (b) XRF, IDMS, INAA
SiO ₂ (wt%)	–	38.54
TiO ₂	11.8	12.39
Al ₂ O ₃	9.0	8.85
Cr ₂ O ₃	0.348	0.32
FeO	18.0	19.67
MnO	0.24	0.29
MgO	7.1	7.83
CaO	10.7	10.94
Na ₂ O	0.42	0.39
K ₂ O	0.06	0.04
P ₂ O ₅		0.11
S		0.19
Nb (ppm)		
Hf	6.2	6.8
Ta	1.5	
Sr		130
Rb		0.37
Li		9.9
Ba		60.6
Co	18.5	20.7
Sc	75	85
La	5.3	5.67
Ce	18	17.9
Nd		18.8
Sm	7.3	7.17
Eu	1.4	1.48
Gd		11.2
Tb	1.9	
Dy	12	13
Er		7.94
Yb	6.7	7.37

Table 1: (Concluded).

Split Technique	,1 (a) INAA	,4 (b) XRF, IDMS, INAA
Lu	1.0	1.07
Ge (ppb)		
Ir		
Au		

Table 2: Rb-Sr composition of 78597.

Data from Nyquist et al. (1976).

Sample	78597,4
wt (mg)	61
Rb (ppm)	0.370
Sr (ppm)	130
$^{87}\text{Rb}/^{86}\text{Sr}$	0.0082 ± 3
$^{87}\text{Sr}/^{86}\text{Sr}$	0.69954 ± 6
T _B	3.76 ± 0.66
T _L	4.34 ± 0.66

B = Model age assuming I = 0.69910 (BABI + JSC bias)

L = Model age assuming I = 0.69903
(Apollo 16 anorthosites for T = 4.6 b.y.)**Table 3: Solar flare induced activity.**

From O'Kelley et al. (1974a).

78597 (a)	
dpm/Kg	
^{26}Al	48 ± 4
^{22}Na	33 ± 4
^{54}Mn	80 ± 10
^{56}Co	80 ± 20
^{46}Sc	25 ± 10
^{48}V	