

**78599****High-Ti Mare Basalt****198.6 g, 7.2 x 4.7 x 3.0 cm****INTRODUCTION**

Sample 78599 is a dark black, fine-grained mare basalt from the large rake sample at Station 8 (Fig. 1).

**PETROGRAPHY**

Sample 78599 is a fine-grained basalt with small phenocrysts of olivine and ilmenite in a fine-grained groundmass with a variolitic texture (Fig 2)

**MINERAL CHEMISTRY**

Warner et al. (1978f) have determined the chemical compositions of the minerals in 78599 (Fig. 3).

**WHOLE-ROCK CHEMISTRY**

Warner et al. (1975b) and Rhodes et al. (1976a) report the chemical composition of 78599 (Table 1 and Fig. 4). Gibson et al. (1976) determined the sulfur content of 78599.

Trace element data indicate that 78599 is a Type A Apollo 17 basalt (see appendix).

**RADIOGENIC ISOTOPES**

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

**SURFACE STUDIES**

Micrometeorite craters are abundant on at least one surface.



Figure 1: Photograph of 78599. Scale is 1 cm. S73-21392.

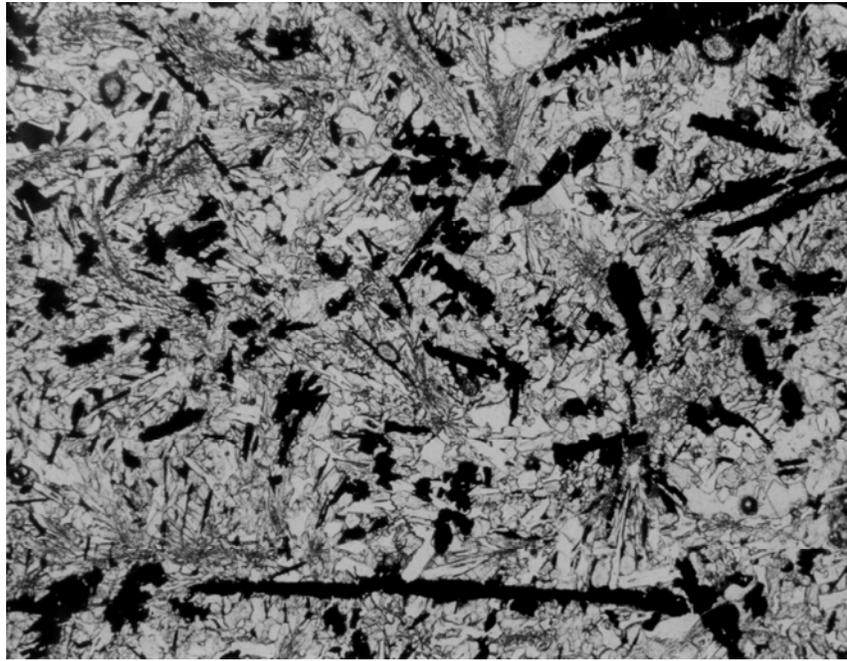


Figure 2: Photomicrograph of thin section 78599,6 Field of view is 3 x 4 mm.

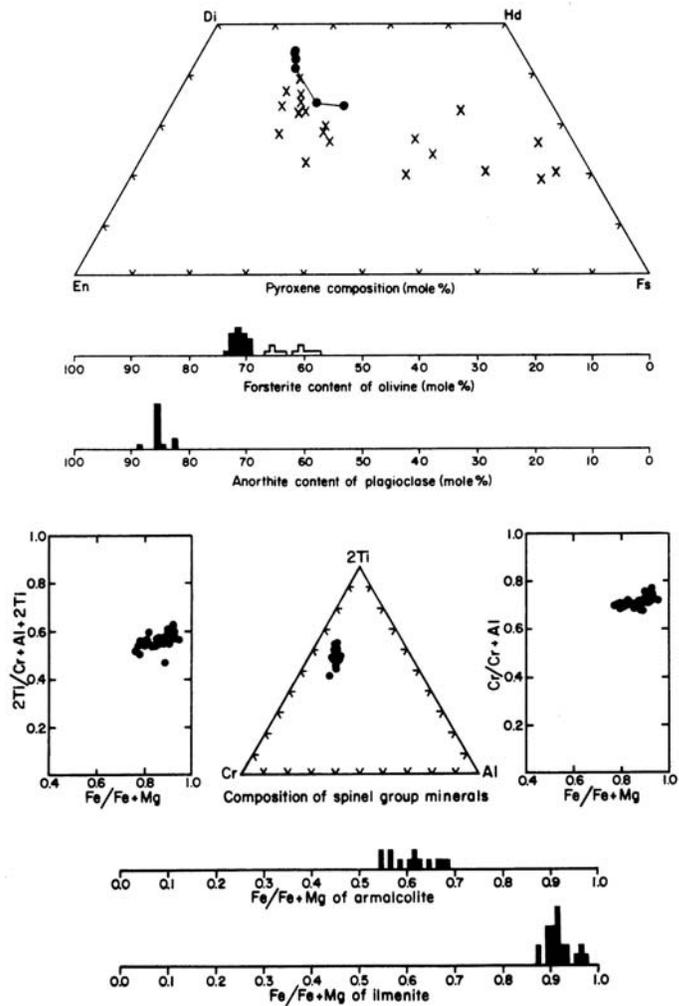


Figure 3: Mineral compositions for 78599. From Warner et al. (1978f).

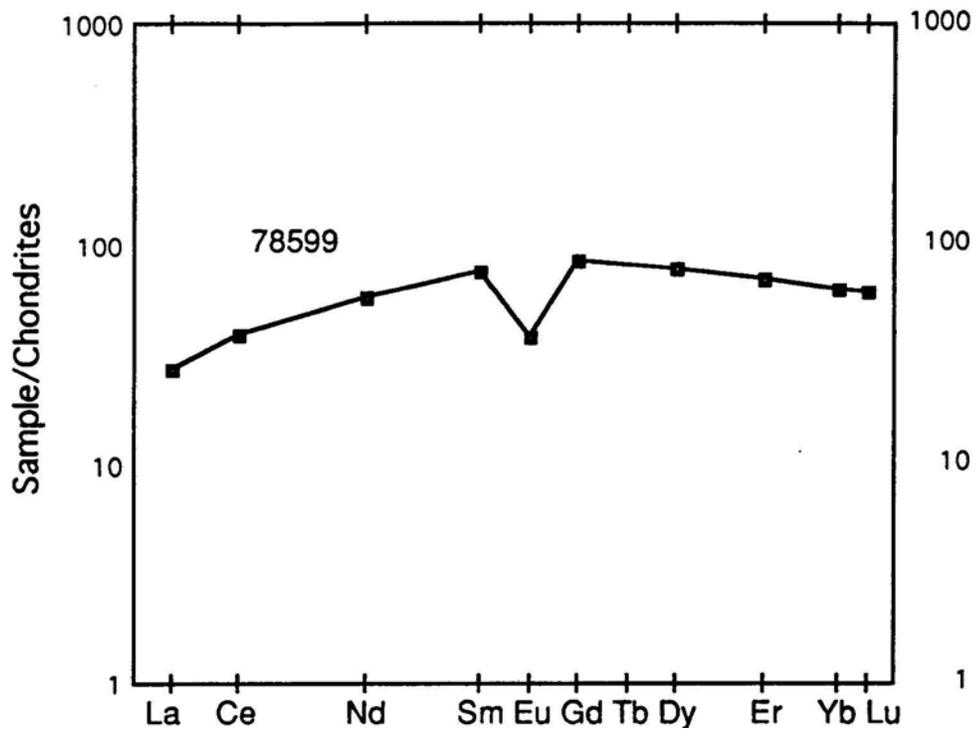


Figure 4: Normalized rare earth element diagram of 78599. Data from Rhodes et al. (1976a).

**Table 1: Whole-rock chemistry of 78599.**  
a) Warner et al. (1975b); b) Rhodes et al. (1976a)

<b>Split Technique</b>	<b>,4 (a) INAA</b>	<b>,3 (b) XRF, IDMS, INAA</b>
SiO <sub>2</sub> (wt%)	–	38.44
TiO <sub>2</sub>	13.0	12.52
Al <sub>2</sub> O <sub>3</sub>	9.2	8.67
Cr <sub>2</sub> O <sub>3</sub>	0.5	0.43
FeO	20.2	19.14
MnO	0.234	0.28
MgO	7.8	8.47
CaO	10.4	10.48
Na <sub>2</sub> O	0.41	0.38
K <sub>2</sub> O	0.076	0.06
P <sub>2</sub> O <sub>5</sub>		0.04
S		0.18
Nb (ppm)		
Hf	9.6	10.1
Ta	2.1	
Sr		190
Rb		0.71
Li		10.4
Ba		83.2
Co	20.6	18.4
Sc	84	79
La	7.1	6.45
Ce	27	23.7
Nd		25.8
Sm	10.2	11
Eu	2.2	2.12
Gd		16.6
Tb	2.5	
Dy	16	18.8
Er		11.2
Yb	9.4	10.2
Lu	1.6	1.46
Ge (ppb)		
Ir		
Au		

**Table 2: Rb-Sr composition of 78599.**  
Data from Nyquist et al. (1976).

Sample	78599,3-2
wt (mg)	50
Rb (ppm)	0.707
Sr (ppm)	190
$^{87}\text{Rb}/^{86}\text{Sr}$	$0.0108 \pm 3$
$^{87}\text{Sr}/^{86}\text{Sr}$	$0.69978 \pm 5$
T <sub>B</sub>	$4.39 \pm 0.45$
T <sub>L</sub>	$4.83 \pm 0.45$

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.)