

78135**High-Ti Mare Basalt**
133.9 g, 5 x 4 x 3 cm**INTRODUCTION**

Sample 78135 is a medium-grained, ilmenite-rich mare basalt collected from the regolith at Station 8 (Fig. 1).

PETROGRAPHY

Brown et al. (1975a) gives the modal mineralogy of 78135 as 0.4% olivine, 24.4% opaques, 20.6% plagioclase, 50.7% pyroxene, and 4% silica. Plagioclase and pyroxene are intergrown in a variolitic texture (Fig. 2).

MINERAL CHEMISTRY

Brown et al. (1975a) report a "new" Zr-rich mineral in 78135 that is closely related in composition to terrestrial zirkelite.

WHOLE-ROCK CHEMISTRY

Rhodes et al. (1976a) measured the chemical composition of 78135 (Table 1 and Fig. 3). Gibson et al. (1976) determined the sulfur content. Keith et al. (1974) and Fruchter et al. (1975) determined the K, U, and Th

contents of Apollo 17 samples, including 78135 (Table 2).

Rhodes et al. classify 78135 as a Type U basalt, but the trace element data indicate that it may be Type A (see appendix).

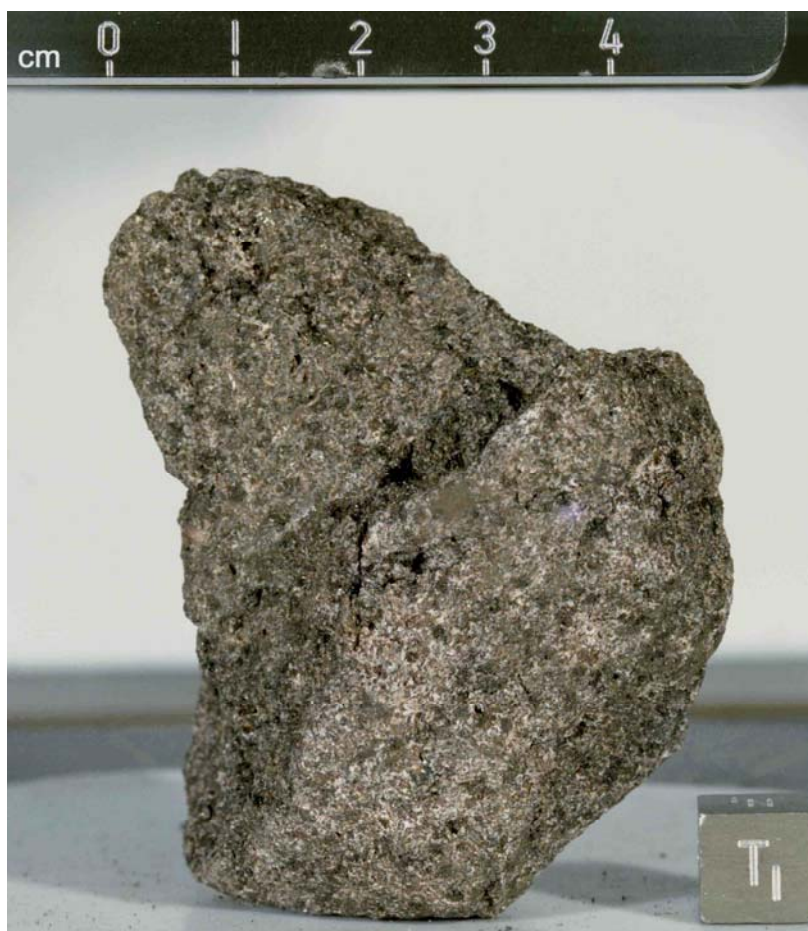


Figure 1: Photograph of 78135. Scale is 1 cm. S73-15003.

RADIOGENIC ISOTOPES

Nyquist et al. (1976) have reported Rb-Sr data for the whole rock (Table 3).

COSMOGENIC RADIOISOTOPES AND EXPOSURE AGES

Some of the Apollo 17 samples (including 78135) provided a unique

opportunity to study the energy spectrum (and potential angular anisotropy) of the incident proton flux from the August 1972 solar flare (Rancitelli et al., 1974; Keith et al., 1974). Table 2 compares the induced activity of 78135 with other samples of Apollo 17 (see also table in 76215).

Drozd et al. (1977) have determined an exposure age of 126 m.y. for 78135 using the ^{81}Kr -Kr method.

SURFACE

Part of the surface of 78135 is covered with a thin film of dark glass.

PROCESSING

The largest remaining piece of 78135 weighs 83 g. There are only three thin sections.

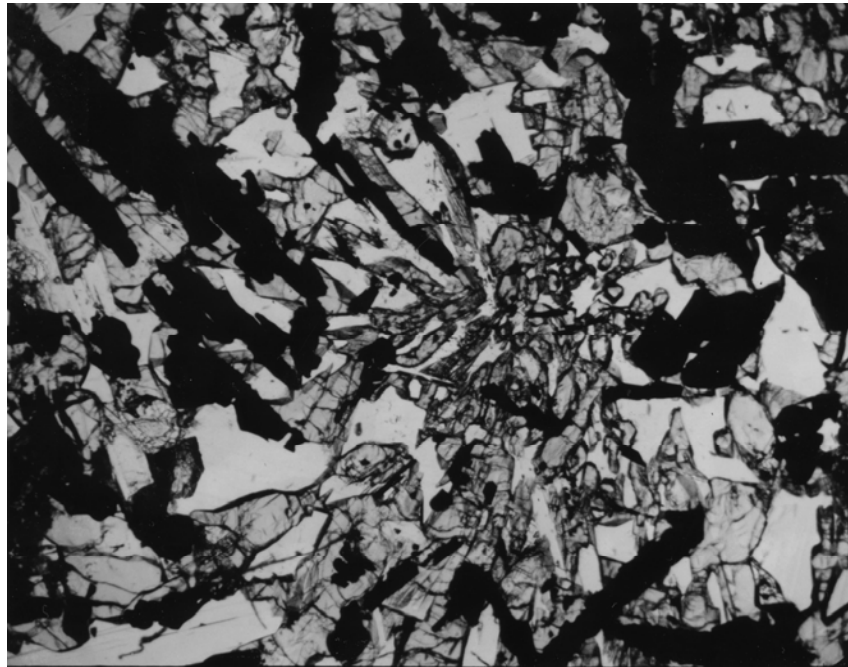


Figure 2: Photomicrograph of thin section 78135,27. Field of view is 3 x 5 mm.

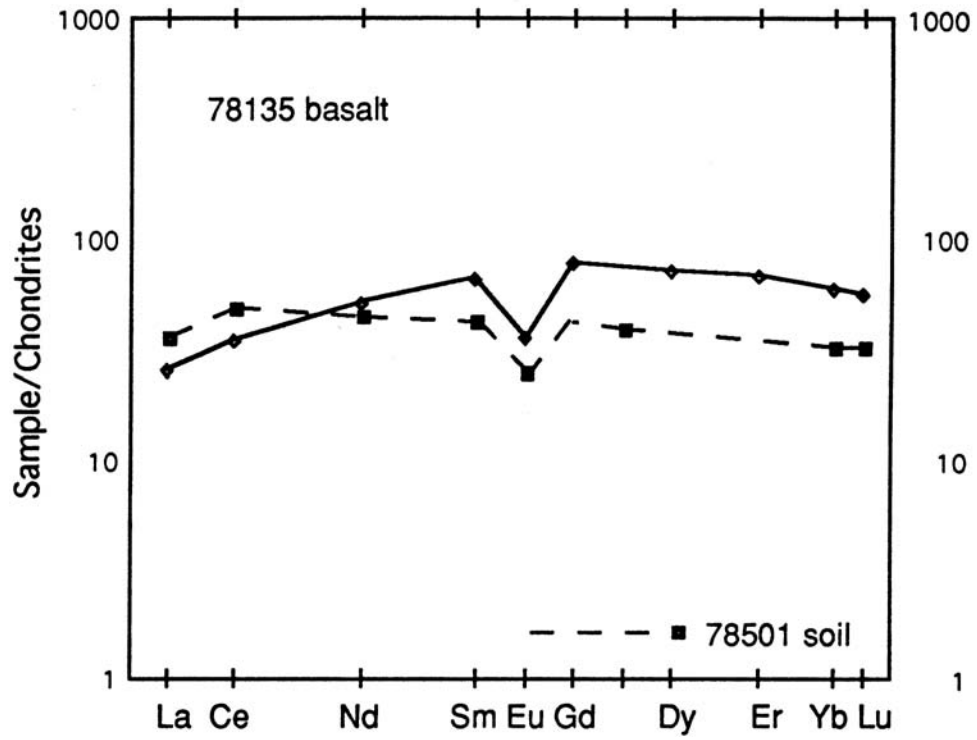


Figure 3: Normalized rare earth element diagram for 78135 basalt compared with 78501 soil. Data from Rhodes et al. (1976a).

Table 1: Whole-rock chemistry of 78135.
From Rhodes et al. (1976a).

Split Technique	5 XRF, IDMS, INAA
SiO ₂ (wt%)	37.98
TiO ₂	12.89
Al ₂ O ₃	8.38
Cr ₂ O ₃	0.45
FeO	19.05
MnO	0.27
MgO	8.69
CaO	10.71
Na ₂ O	0.36
K ₂ O	0.05
P ₂ O ₅	0.04
S	0.18
Nb (ppm)	
Hf	9.3
Sr	174
Rb	0.58
Li	9.2
Ba	74.1
Ni	
Co	18.4
Sc	84
La	5.8
Ce	20.2
Nd	22.4
Sm	9.43
Eu	1.93
Gd	14.9
Tb	
Dy	17
Er	10.5
Yb	9.21
Lu	1.33
Ge (ppb)	
Ir	
Au	

Table 2: Solar flare induced activity from large solar flare, August 1972.
From Keith et al. (1974).

	Sample 78135	Sample 78235	Sample 78255
dpm/Kg			
²⁶ Al	42 ± 4	77 ± 7	65 ± 6
²² Na	74 ± 5	111 ± 8	50 ± 5
⁵⁴ Mn	180 ± 20	55 ± 8	10 ± 5
⁵⁶ Co	240 ± 20	52 ± 9	30 ± 20
⁴⁶ Sc	76 ± 5	1.4 ± .9	<15
⁴⁸ V	18 ± 5	<12	
Th (ppm)	.26	.59	.83
U (ppm)	.107	.196	.227
K (%)	.0525	.049	.059

Table 3: Rb-Sr composition of 78135.
Data from Nyquist et al. (1976).

Sample	78135,5
wt (mg)	50
Rb (ppm)	0.584
Sr (ppm)	174
⁸⁷ Rb/ ⁸⁶ Sr	0.0097 ± 3
⁸⁷ Sr/ ⁸⁶ Sr	0.69969 ± 6
T _B	4.25 ± 0.56
T _L	4.74 ± 0.56

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.)