78575
Ilmenite Basalt
140 grams

Figure 1: Photo of 78575. Sample is 5 cm across. S73-31350

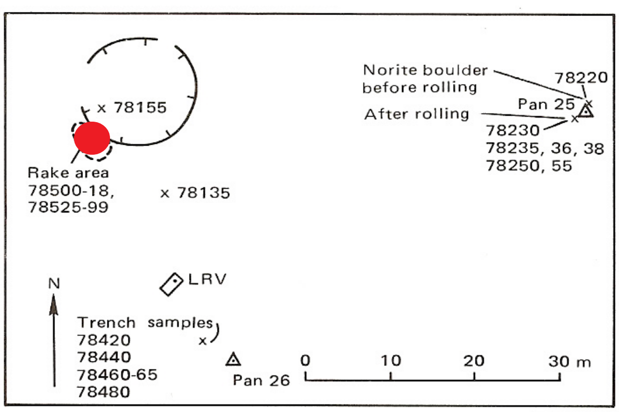


Figure 2: Location where 78575 was found.

Introduction
78575 is a well-rounded granular high-Ti basalt with low Rb content (figure 1). It is from a rake sample collected as part of a large comprehensive sample at station 8, Apollo 17 (figure 2).

Petrography
78575 is termed an "allotrimorphic-granular ilmenite basalt" by Warner et al. (1978). In any case, 78575 is a relatively coarse-grained basalt with long tabular plagioclase crystals separating clusters of ilmenite and pyroxene crystals (figure 4). Armalcolite, tranquillityite and zirconolite are reported (Warner et al. 1978). Pyroxene tends to form in clusters and has

Mineralogical Mode

Olivine	tr.
Pyroxene	51.5
Plagioclase	29.9
Opaques	16.5
Silica	1.8
Meostasis	0.4

rather complex zoning patterns (figure 3). Ilmenite forms in chains.

The composition of armalcolite is lower in Ti and higher in Fe (table 2).

Chemistry

Warner et al. (1975) first reported the composition, which has generally been confirmed by later analyses (Neal 2001). Neal (2001) found that this basalt had very low Rb, compared with other Apollo 17 basalts (figures 5, 6 and 7).

Radiogenic age dating

Apollo 17 mare basalts are generally considered 3.72 ± 0.04 b.y. old (see Paces et al. 1991).

Processing

There are three thin sections.

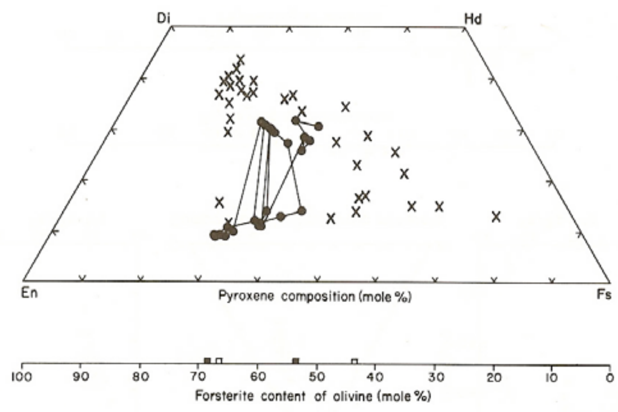


Figure 3: Composition of pyroxene and ilmenite in 78575 (Warner et al. 1978).

Table 2: Armalcolite in 78575.
(Warner et al. 1976)

TiO2	69.5	68.7
Al2O3	1.35	1.84
Cr2O3	1.46	1.28
V2O3	0.05	0.06
FeO	18	18.9
MgO	6.6	5.7
CaO	0.78	0.68
ZrO2		0.08

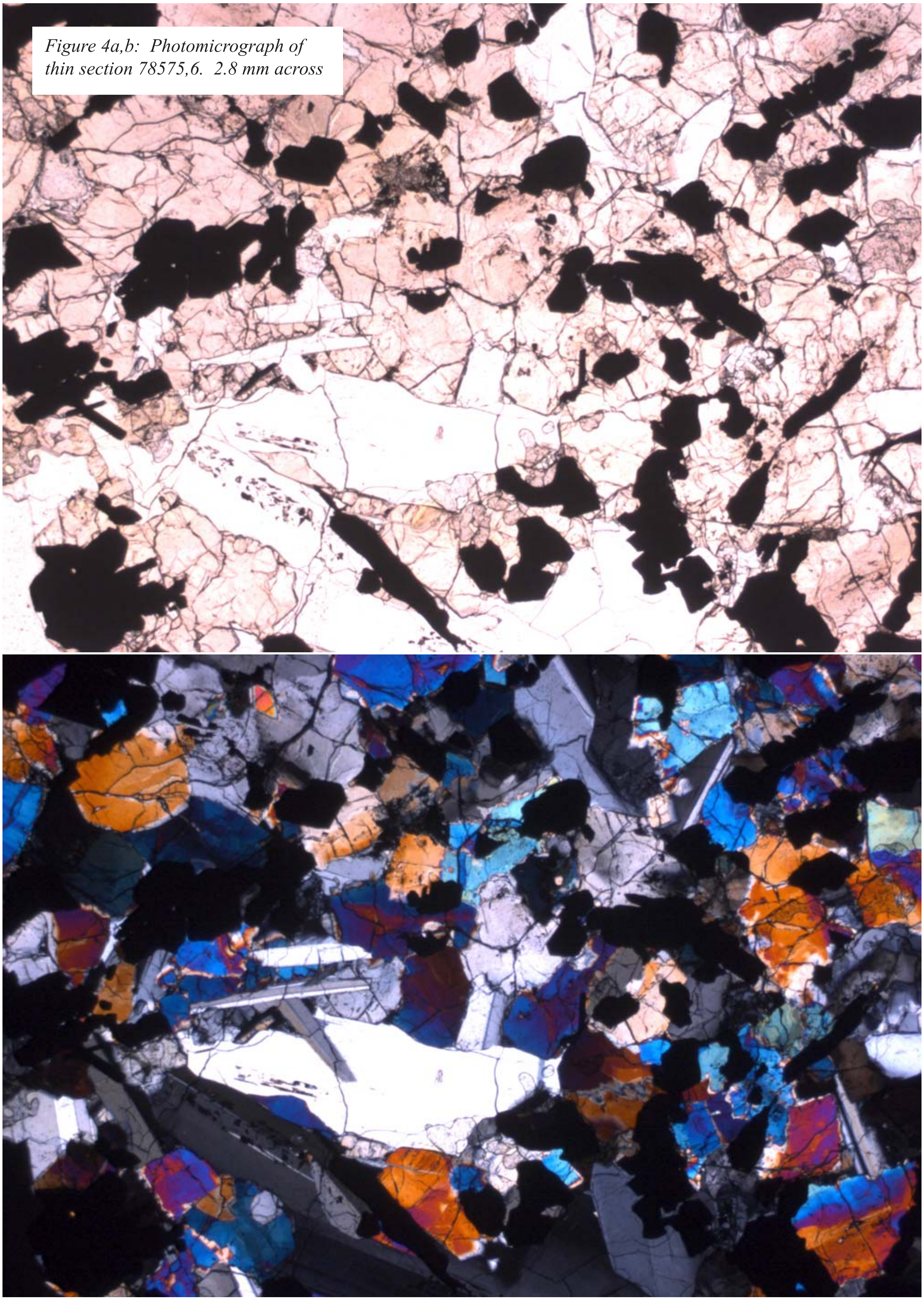


Figure 4a,b: Photomicrograph of thin section 78575,6. 2.8 mm across

Table 1. Chemical composition of 78575.

reference	Neal2001		Warner75	
weight			Warner78	
SiO2 %				
TiO2			11.8	(c)
Al2O3			9	(c)
FeO			17	(c)
MnO			0.216	(c)
MgO			7.5	(c)
CaO			11	(c)
Na2O			0.36	(c)
K2O			0.04	(c)
P2O5				
S %				
sum				
Sc ppm	87	(a)	75	(c)
V	79	(a)	100	(c)
Cr	3260	(a)		
Co	21	(a)	16.1	(c)
Ni	3.7	(a)		
Cu	37	(a)		
Zn	89	(a)		
Ga	3.86	(a)		
Ge ppb				
As				
Se				
Rb	0.27	(a)		
Sr	157	(a)		
Y	91	(a)		
Zr	257	(a)		
Nb	23	(a)		
Mo	30	(a)		
Ru				
Rh				
Pd ppb				
Ag ppb				
Cd ppb				
In ppb				
Sn ppb				
Sb ppb	10	(a)		
Te ppb				
Cs ppm				
Ba	69	(a)		
La	5.28	(a)	3.6	(c)
Ce	21.1	(a)	15	(c)
Pr	3.38	(a)		
Nd	22.5	(a)		
Sm	9.16	(a)	6.7	(c)
Eu	1.77	(a)	1.47	(c)
Gd	13.6	(a)		
Tb	2.56	(a)	1.8	(c)
Dy	17.1	(a)	11	(c)
Ho	3.54	(a)		
Er	9.78	(a)		
Tm	1.41	(a)		
Yb	9.74	(a)	6.6	(c)
Lu	1.27	(a)	0.95	(c)
Hf	7.23	(a)	5.4	(c)
Ta	1.43	(a)	1.2	(c)
W ppb	90	(a)		
Re ppb				
Os ppb				
Ir ppb				
Pt ppb				
Au ppb				
Th ppm	0.3	(a)		
U ppm	0.1	(a)		

technique: (a) ICP-MS, (c) INAA

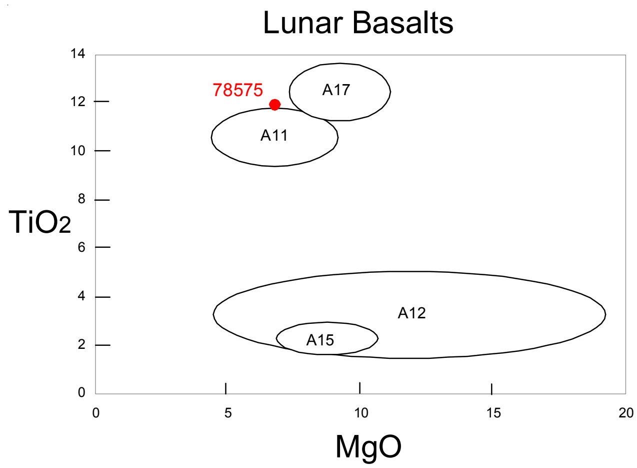


Figure 5: Composition of lunar basalts.

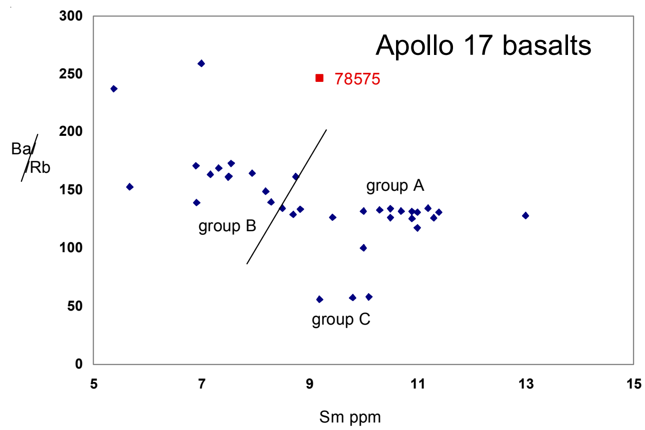


Figure 6: Trace element characteristics of Apollo 17 basalts.

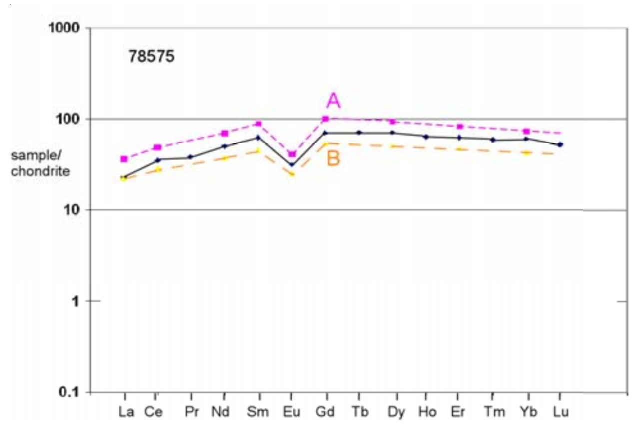
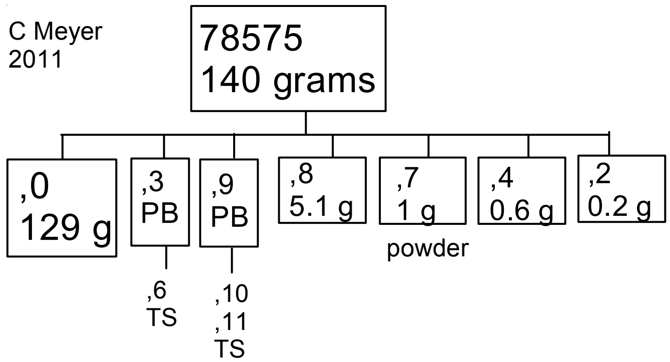


Figure 7: Normalized rare-earth-element diagram for 78575 compared with A and B types of Apollo 17 basalt.



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