

70185
Ilmenite Basalt
466.6 grams



Figure 1: Photo of top, zap pitted surface of 70185. NASA S73-15874. Cube is 1 cm. Note the smooth, rounded exterior surface due to micrometeorite erosion.

Introduction

70185 was collected from the regolith near the deep drill site at the Apollo 17 ALSEP station. It is a coarse-grained high-Ti mare basalt (figure 1). It has micrometeorite craters on all sides and has regions where there are numerous interconnecting vugs (figure 2 and 3).

70185 has not been well studied and has not been dated.

Petrography

70185 is a granular pyroxene-plagioclase rock with little olivine and abundant ilmenite. Brown et al. (1975) give the mineralogic mode (with rather high ilmenite abundance). The average grain size is about 0.8 mm (figure 4). Mineral chemistry has not been reported.

Chemistry

The chemical analyses of 70185 are not in agreement, perhaps because only small portions were analyzed and it is coarse-grained. However, it has less Ti than the majority of Apollo 17 basalts (figure 5). The REE pattern is typical of Apollo 17 basalts (figure 7).

Radiogenic age dating

Nyquist et al. (1976) determined the isotopic composition of Sr, but did not report an age.

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



Figure 2: Photo of bottom, freshly broken surface of 70185 showing numerous vugs. NASA S73-17312. Sample is about 7 cm across.

Mineralogical Mode for 70185

	Brown et al. 1975
Olivine	0.4
Pyroxene	47.6
Plagioclase	24
Opakes	23.9
Silica	4.1
Mesotasis	-

Cosmogenic isotopes and exposure ages

Drozd et al. (1977) found that 70185 had a $^{81}\text{Kr} = 113$ m.y. exposure age.

O'Kelley et al. (1974) determined the cosmic-ray-induced activity of $^{22}\text{Na} = 50$ dpm/kg., $^{26}\text{Al} = 70$ dpm/kg., $^{46}\text{Sc} = 47$ dpm/kg., $^{54}\text{Mn} = 95$ dpm/kg and $^{56}\text{Co} = 105$ dpm/kg.

Processing

There are 4 thin section of 70185.

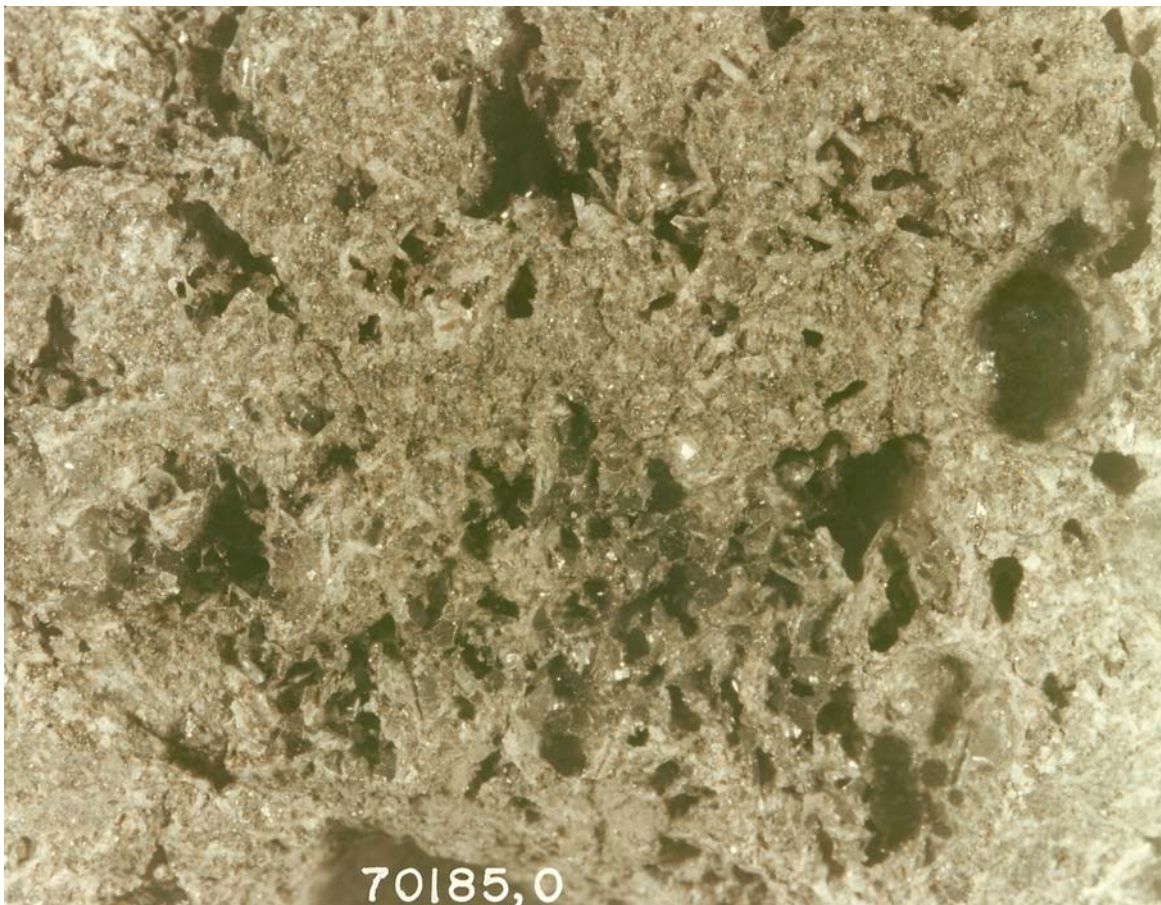
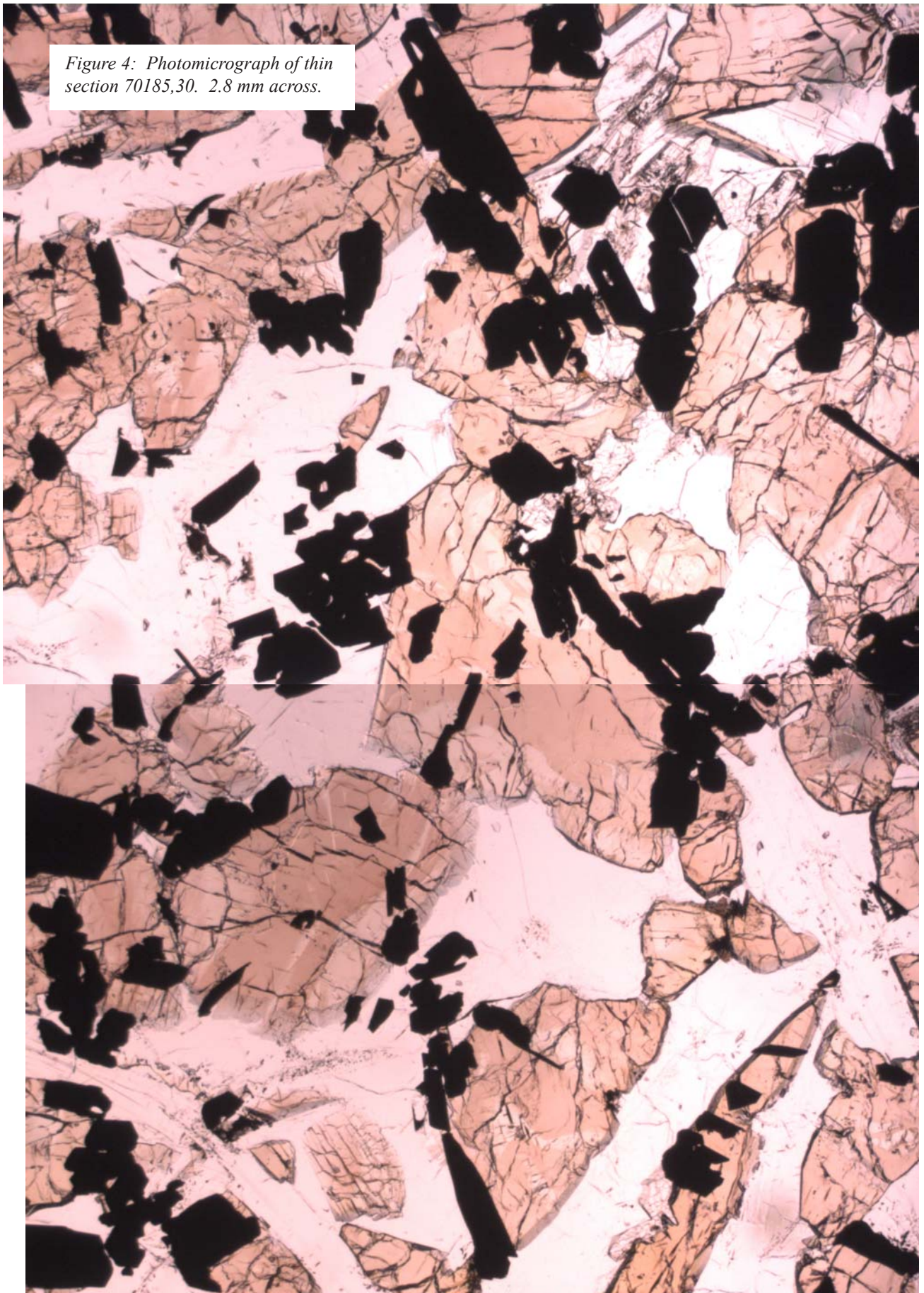


Figure 3: 70185 has large vugs that are lined with fresh crystals. S73-17805. Scale about 1 cm across.

Figure 4: Photomicrograph of thin section 70185,30. 2.8 mm across.



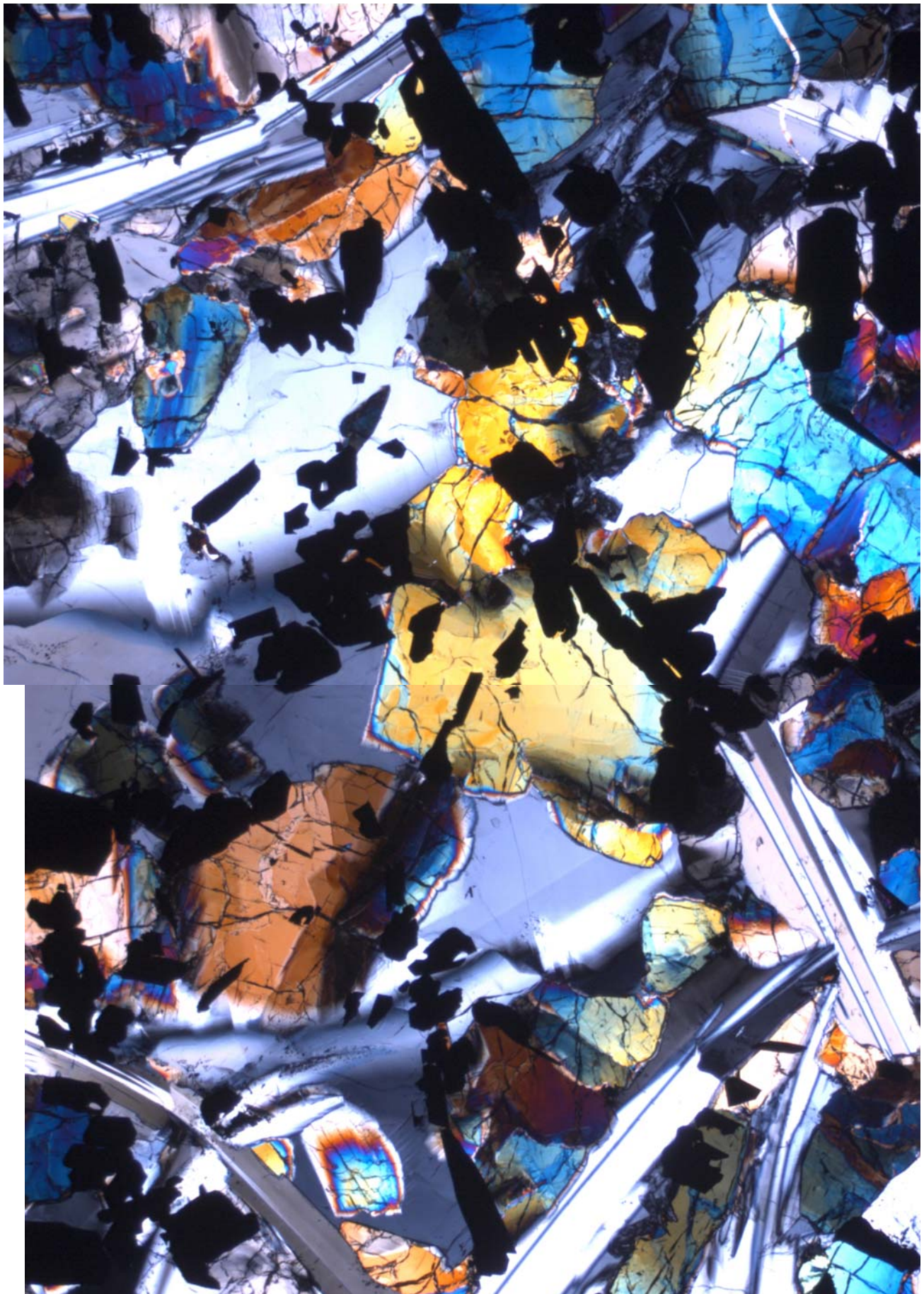


Table 1. Chemical composition of 70185.

reference weight	Warner 75	Eldridge74	Rhodes76 Nyquist76	
SiO ₂ %			40.18	(c)
TiO ₂	9.6	(a)	11.52	(c)
Al ₂ O ₃	10.2	(a)	9.04	(c)
FeO	18.9	(a)	17.64	(c)
MnO	0.237	(a)	0.26	(c)
MgO	8.1	(a)	8.11	(c)
CaO	11.1	(a)	11.95	(c)
Na ₂ O	0.433	(a)	0.39	(c)
K ₂ O	0.093	(a)	0.04	(c)
P ₂ O ₅		0.05 (b)	0.02	(c)
S %			0.17	(c)
sum				
Sc ppm	84	(a)	84	(a)
V	72	(a)		
Cr	2400	(a)	2737	(c)
Co	15.9	(a)	19.7	(a)
Ni				
Cu				
Zn				
Ga				
Ge ppb				
As				
Se				
Rb			0.49	(d)
Sr			173	(d)
Y				
Zr				
Nb				
Mo				
Ru				
Rh				
Pd ppb				
Ag ppb				
Cd ppb				
In ppb				
Sn ppb				
Sb ppb				
Te ppb				
Cs ppm				
Ba			66.3	(d)
La	11.1	(a)	5.24	(d)
Ce			18.5	(d)
Pr				
Nd			21.1	(d)
Sm	15.4	(a)	8.83	(d)
Eu	2.74	(a)	1.87	(d)
Gd			14	(d)
Tb				
Dy	28	(a)	16	(d)
Ho				
Er			9.52	(d)
Tm				
Yb	14.7	(a)	8.67	(d)
Lu	1.9	(a)	1.21	(a)
Hf			8.2	(a)
Ta				
W ppb				
Re ppb				
Os ppb				
Ir ppb				
Pt ppb				
Au ppb				
Th ppm		0.38	(b)	
U ppm		0.11	(b)	

technique: (a) INAA, (b) radiation count. (c) XRF, (d) IDMS

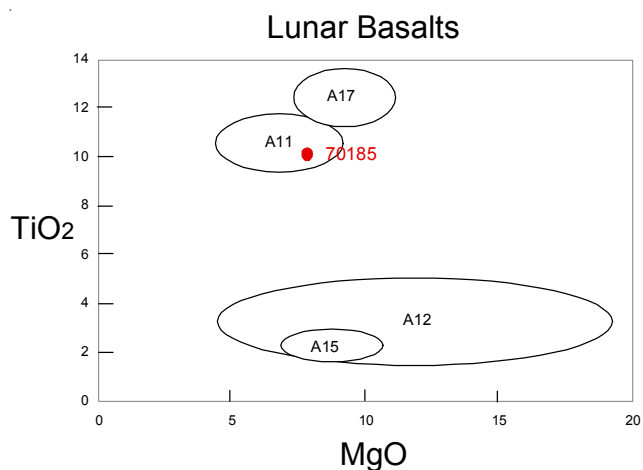


Figure 5: Composition of 70185 compared with that of other Apollo basalts.

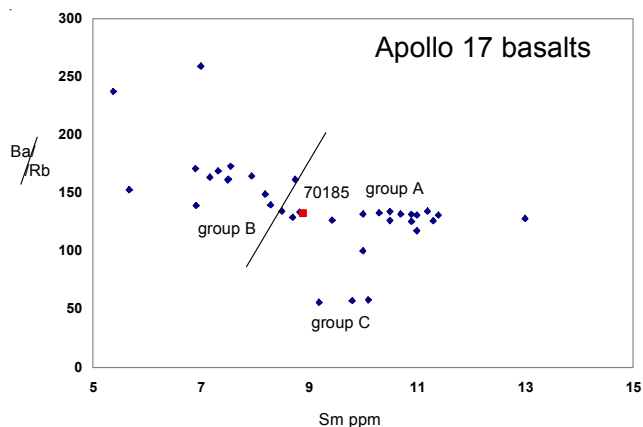


Figure 6: Trace element diagram for Apollo 17.

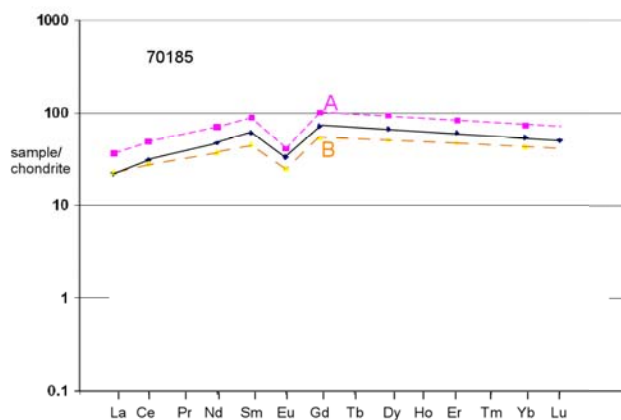
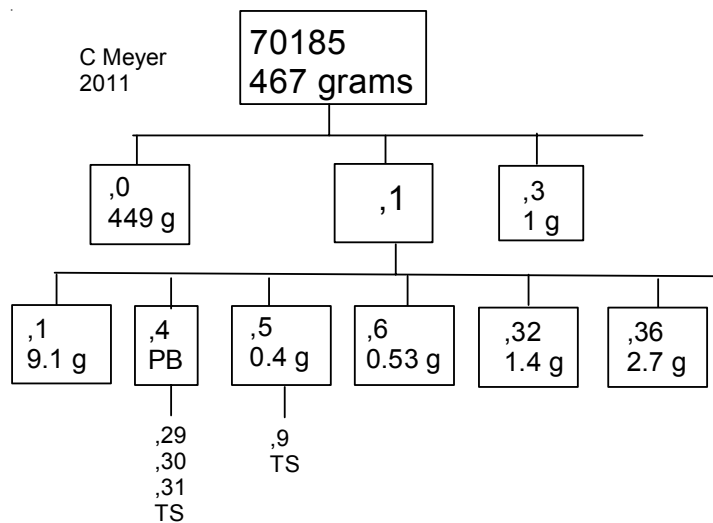


Figure 7: Normalized rare-earth-element diagram for 07185 and type A and B basalts.



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