

**10092**

Ilmenite Basalt (low K)

46 grams



Figure 1: Photo of 10092,0. NASA S76-25871. Sample is about 3 cm.

### **Introduction**

10092 is a low-K, ilmenite basalt (figure 1). It was originally labeled 10002,22, but because of its size, was renumbered 10092. It was returned in rock box #1003.

### **Petrography**

According to Beaty and Albee (1978), 10092 is similar in texture to 10045 and 10020. These rocks have an overall texture characterized by an open network of randomly-oriented plagioclase laths and ilmenite platelets with dominant pyroxene in between. Minor minerals include a silica phase, ulvospinel, Cr-spinel, troilite and a K-rich glass.

Olivine in 10092 is too Mg-rich to be in equilibrium with the bulk composition, indicating that it may have cumulate origin.

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### **Mineralogical Mode for 10092**

	<b>Beaty and Albee 1978</b>
Olivine	4.9
Pyroxene	45
Plagioclase	31
Ilmenite	15.6
Glass	0.14
silica	2.6
troilite	0.23
phosphate	0.06

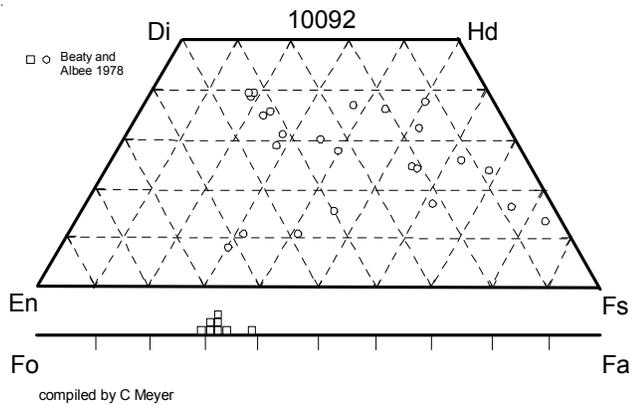


Figure 2: Pyroxene and olivine composition of 10092 (from Beaty and Albee 1978).

**Mineralogy**

**Olivine:** Olivine is  $Fe_{72-60}$ .

**Pyroxene:** Pyroxene has compositional zoning (figure 2).

**Plagioclase:** Plagioclase is  $An_{92-82}$ .

**Ilmenite:** Ilmenite has 2.5% MgO (Beaty and Albee 1978).

**Chemistry**

Rhodes and Blanchard (1980) obtained an analysis of 10092 (table 1, figures 3 and 4).

**Radiogenic age dating**

10092 has not be dated.

**Processing**

Apollo 11 samples were originally described and cataloged in 1969 and “re-cataloged” by Kramer et al. (1977).

**List of Photo #s for 10092**

S76-25871 – 76 color mug

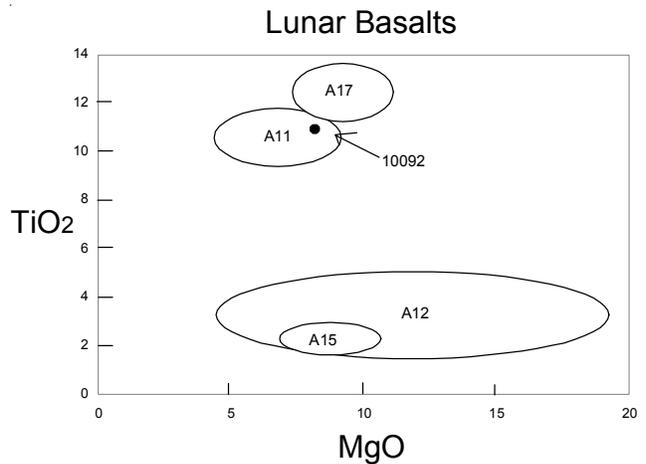


Figure 3: Composition of 10092 compared with that of other Apollo lunar samples.

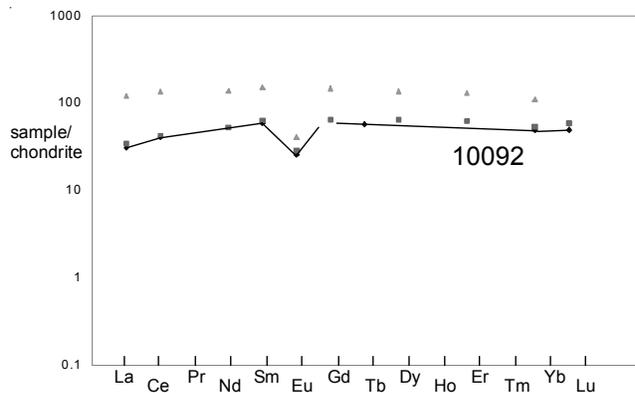
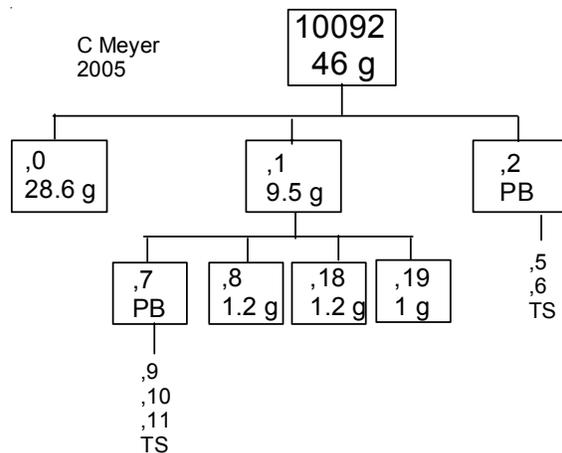


Figure 4: Normalized rare-earth-element composition for low-K basalt 10092 (the line) compared with that of low-K basalt 10020 and high-K basalt 10049 (the dots) (data from Wiesmann et al. 1975).



**Table 1. Chemical composition of 10092.**

reference weight	Rhodes80		Beaty 78	
SiO2 %	38.85	(a)	38.05	(c)
TiO2	10.87	(a)	12.74	(c)
Al2O3	9.44	(a)	9.66	(c)
FeO	19.35	(a)	18.38	(c)
MnO	0.3	(a)	0.23	(c)
MgO	8.52	(a)	8.9	(c)
CaO	10.99	(a)	11.38	(c)
Na2O	0.34	(b)	0.33	(c)
K2O	0.06	(a)	0.02	(c)
P2O5	0.07	(a)	0.03	(c)
S %			0.11	(c)
sum				
Sc ppm	82			
V				
Cr	2930	(b)	3010	(c)
Co	19.3			
Ni				
Cu				
Zn				
Ga				
Ge ppb				
As				
Se				
Rb				
Sr				
Y				
Zr				
Nb				
Mo				
Ru				
Rh				
Pd ppb				
Ag ppb				
Cd ppb				
In ppb				
Sn ppb				
Sb ppb				
Te ppb				
Cs ppm				
Ba				
La	7.3	(b)		
Ce	25	(b)		
Pr				
Nd				
Sm	8.9	(b)		
Eu	1.48	(b)		
Gd				
Tb	2.1	(b)		
Dy				
Ho				
Er				
Tm				
Yb	8.1	(b)		
Lu	1.22	(b)		
Hf	6.8	(b)		
Ta	1.4	(b)		
W ppb				
Re ppb				
Os ppb				
Ir ppb				
Pt ppb				
Au ppb				
Th ppm				
U ppm				

technique: (a) XRF, (b) INAA, (c) elec. Probe