12062

Ilmenite Basalt

738.7 grams

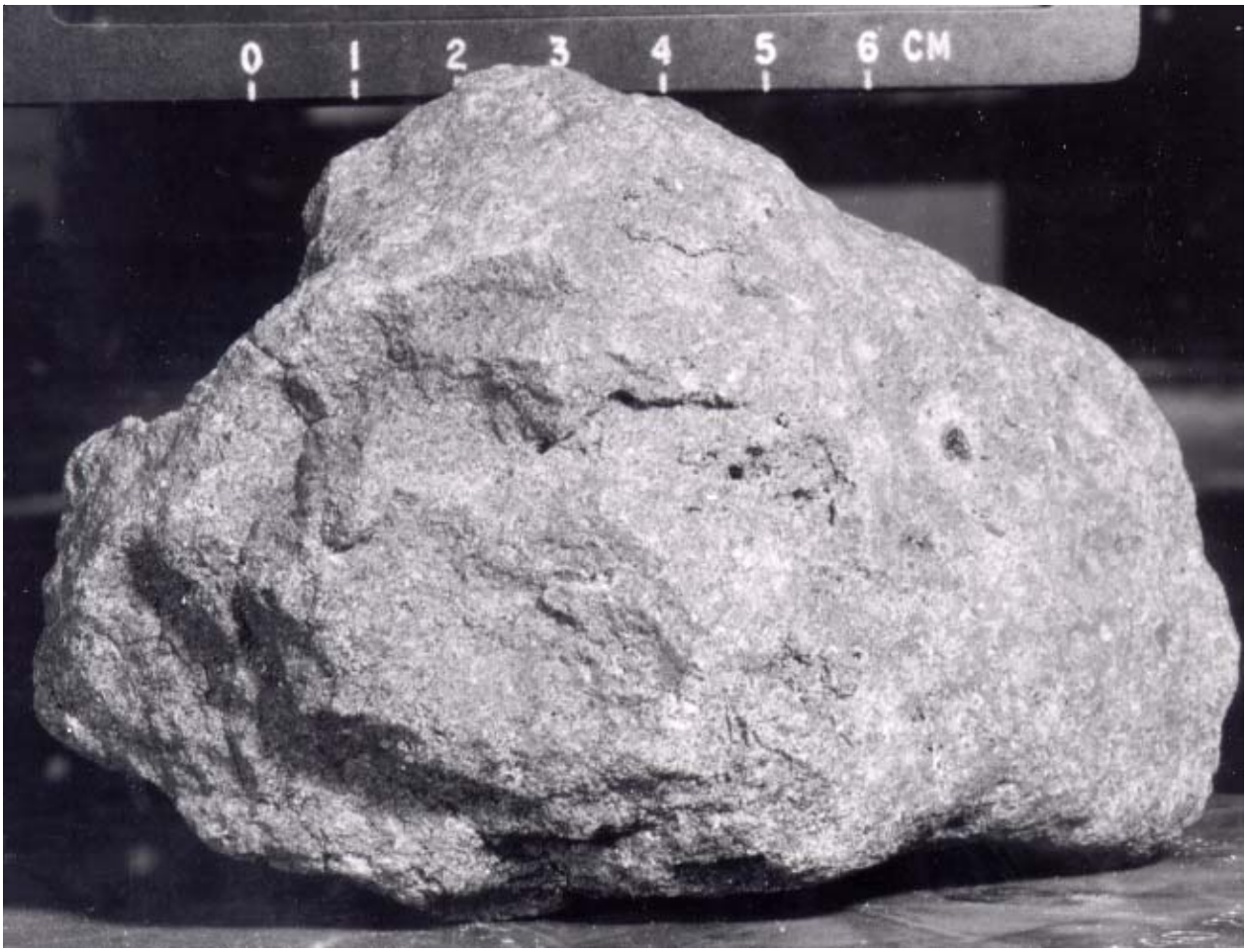


Figure 1: Photo of lunar sample 12062,0 showing large zap pit with black glass lining. Scale is in cm. NASA #S69-61661.

Introduction

12062 is an subophitic ilmenite basalt with high percentage of pyroxene and medium grain size (figure 2). It has not been dated.

Petrography

Neal et al. (1994) analyzed 12062 and studied a covered thin section, but couldn't determine mineral contents. From the mineral mode and the chemical composition, they determined that 12062 is an ilmenite basalt with ophitic to sub-ophitic texture with grain size about 1 mm.

Mineralogical Mode for 12062

	Neal et al. 1994
Olivine	- -
Pyroxene	57
Plagioclase	32.2
Ilmenite	0.3
Chromite +Usp	5.2
mesostasis	3.5
"silica"	1.4

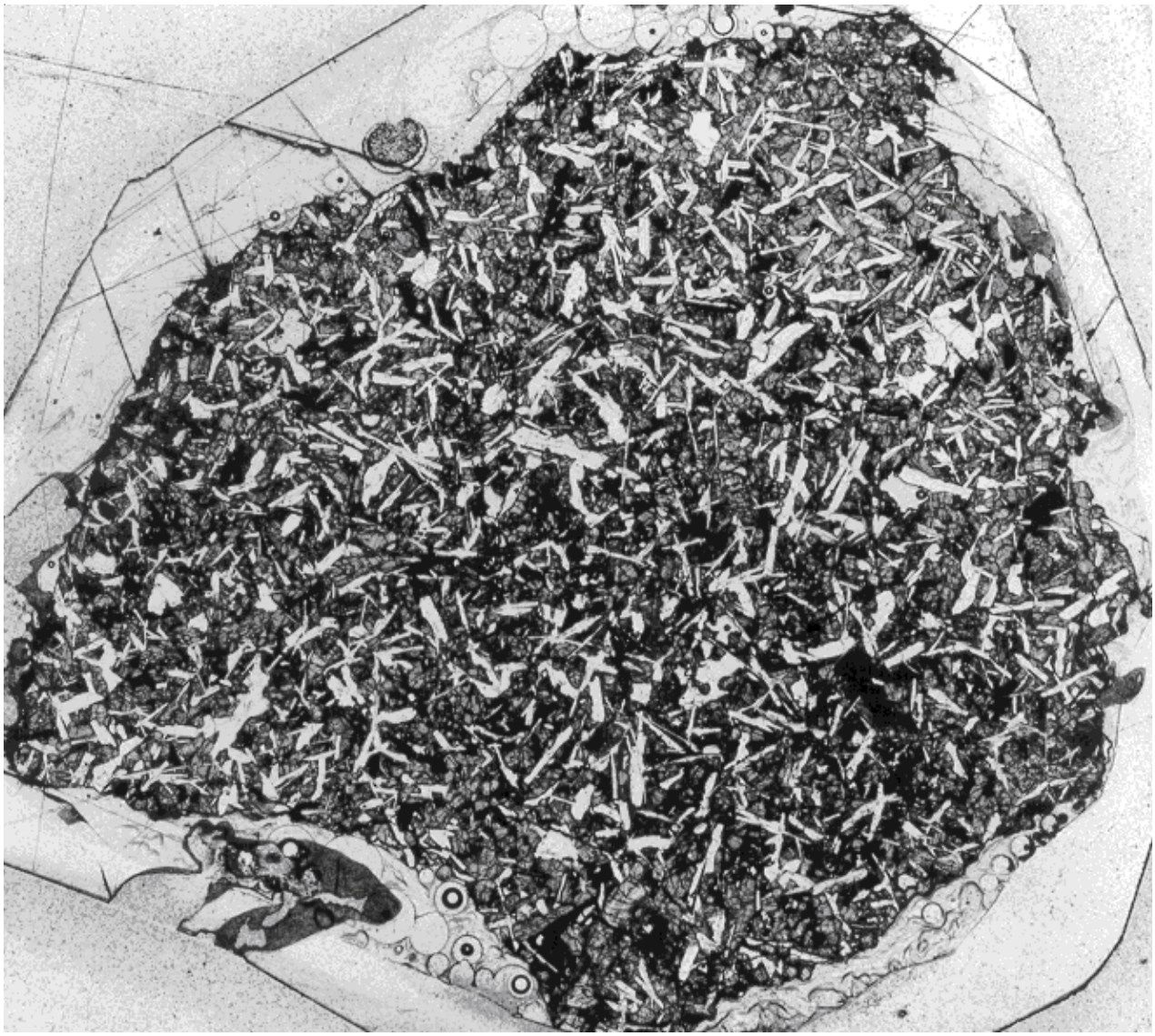


Figure 2: Photomicrograph of thin section 12062,9. Scale about 3 cm. NASA #S70-30255.

Chemistry

The chemical composition of 12062 was determined by Neal et al. (1994) who obtained values for K and Th similar to the whole rock values determined by Rancitelli et al. (1971).

Radiogenic age dating

12062 has not been dated.

Cosmogenic isotopes and exposure ages

Rancitelli et al. (1971) determined the cosmic ray induced activity of ^{22}Na (33 dpm/kg), ^{26}Al (76 dpm/kg) and ^{54}Mn (33 dpm/kg).

Other Studies

Bogard et al. (1971) reported the content and isotopic composition of rare gases in 12062.

There aee 7 thin sections.

List of Photo #s for 12062

S69-61600 – 61662	
S69-60860 – 60883	mug
S70-49524	TS
S70-49843 – 49846	TS
S70-49528 – 49533	TS

Figure 3: Photomicrographs of thin section 12062,11 (plane-polarized, crossed -nicols). Field of view is 2.6 mm.

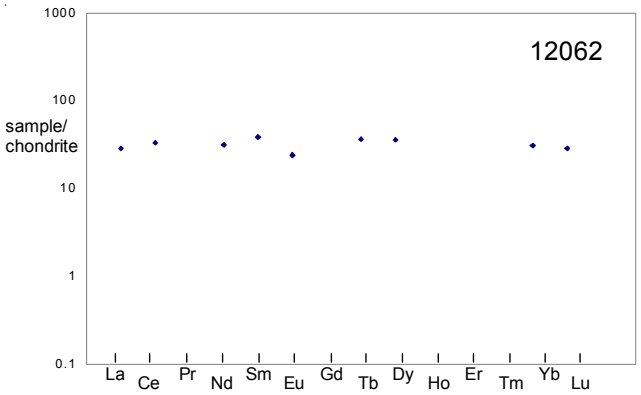


Figure 4: Rare-earth-element composition of 12062 (from Neal et al. 1994).

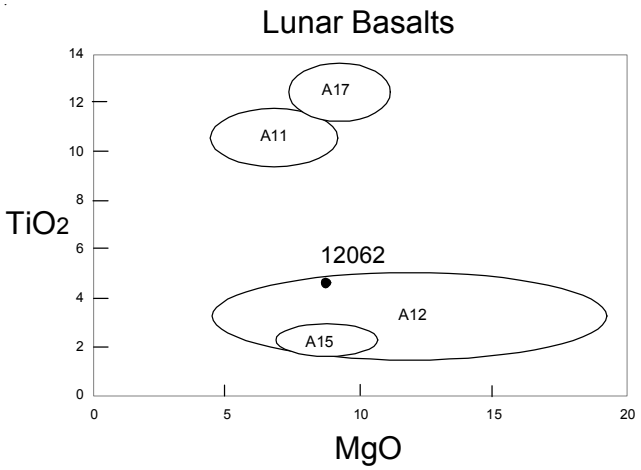
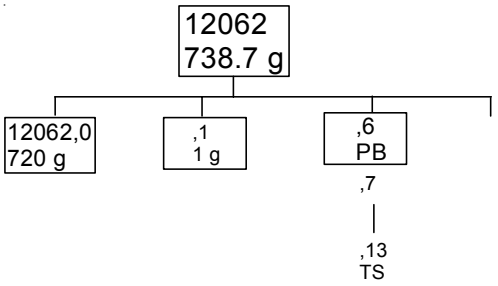


Figure 5: Compsosition of 12062 compared with that of other lunar basalts.

Table 1. Chemical composition of 12062.

reference	Neal94		LSPET70		O'Kelly71		Rancitelli71	
weight	.617 g		730 g		739 g		727 g	
SiO2 %								
TiO2	4.6	(a)						
Al2O3	10.3	(a)						
FeO	20.7	(a)						
MnO	0.266	(a)						
MgO	8.1	(a)						
CaO	9.9	(a)						
Na2O	0.297	(a)						
K2O	0.06	(a)	0.063	(b)	0.061	(b)	0.071	(b)
P2O5								
S %								
sum								
Sc ppm	59.1	(a)						
V	140	(a)						
Cr	2120	(a)						
Co	32.7	(a)						
Ni								
Cu								
Zn								
Ga								
Ge ppb								
As								
Se								
Rb								
Sr	180	(a)						
Y								
Zr								
Nb								
Mo								
Ru								
Rh								
Pd ppb								
Ag ppb								
Cd ppb								
In ppb								
Sn ppb								
Sb ppb								
Te ppb								
Cs ppm								
Ba	69	(a)						
La	6.9	(a)						
Ce	20.2	(a)						
Pr								
Nd	14.6	(a)						
Sm	5.8	(a)						
Eu	1.36	(a)						
Gd								
Tb	1.34	(a)						
Dy	8.8	(a)						
Ho								
Er								
Tm								
Yb	5	(a)						
Lu	0.7	(a)						
Hf	3.9	(a)						
Ta	0.45	(a)						
W ppb								
Re ppb								
Os ppb								
Ir ppb								
Pt ppb								
Au ppb								
Th ppm	0.77	(a)	0.81	(b)	0.83	(b)	0.871	(b)
U ppm			0.21	(b)	0.22	(b)	0.241	(b)

technique: (a) INAA , (b) radiation counting



References for 12062

Bogard D.D., Funkhouser J.G., Schaeffer O.A. and Zahringer J. (1971) Noble gas abundances in lunar material-cosmic ray spallation products and radiation ages from the Sea of Tranquillity and the Ocean of Storms. *J. Geophys. Res.* **76**, 2757-2779.

James O.B. and Wright T.L. (1972) Apollo 11 and 12 mare basalts and gabbros: Classification, compositional variations and possible petrogenetic relations. *Geol. Soc. Am. Bull.* **83**, 2357-2382.

LSPET (1970) Preliminary examination of lunar samples from Apollo 12. *Science* **167**, 1325-1339.

Neal C.R., Hacker M.D., Snyder G.A., Taylor L.A., Liu Y.-G. and Schmitt R.A. (1994a) Basalt generation at the Apollo 12 site, Part 1: New data, classification and re-evaluation. *Meteoritics* **29**, 334-348.

Neal C.R., Hacker M.D., Snyder G.A., Taylor L.A., Liu Y.-G. and Schmitt R.A. (1994b) Basalt generation at the Apollo 12 site, Part 2: Source heterogeneity, multiple melts and crustal contamination. *Meteoritics* **29,** 349-361.

Papike J.J., Hodges F.N., Bence A.E., Cameron M. and Rhodes J.M. (1976) Mare basalts: Crystal chemistry, mineralogy and petrology. *Rev. Geophys. Space Phys.* **14**, 475-540.

Rancitelli L.A., Perkins R.W., Felix W.D. and Wogman N.A. (1971) Erosion and mixing of the lunar surface from cosmogenic and primordial radionuclide measurement in Apollo 12 lunar samples. *Proc. 2nd Lunar Sci. Conf.* 1757-1772.

Sutton R.L. and Schaber G.G. (1971) Lunar locations and orientations of rock samples from Apollo missions 11 and 12. *Proc. 2nd Lunar Sci. Conf.* 17-26.