

12043

Pigeonite Basalt
60 grams

DRAFT

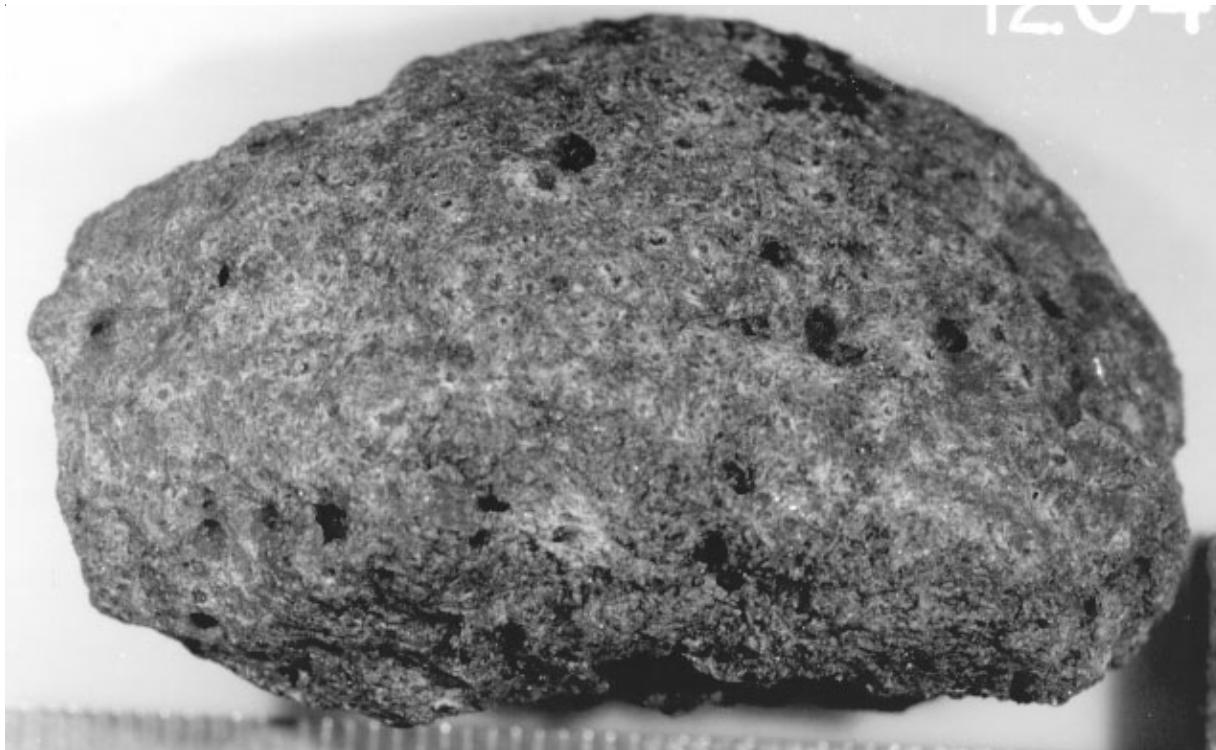


Figure 1: Lunar basalt 12043,0 showing zap pits and rounded surface. Sample is 4 cm. NASA # S94-035810.

Introduction

All sides of this little potato have numerous micrometeorite craters (figure 1). It has not been dated.

Petrography

The petrology of 12043 is discussed in Baldridge et al. (1979). 12043 is a medium-grained pigeonite basalt with 10% large (3 mm), prismatic phenocrysts of pyroxene and olivine set in a subophitic to variolitic groundmass of pyroxene, plagioclase, ilmenite, chromite, cristobalite, metallic iron and mesostasis. Olivine phenocrysts are embayed, and overgrown by pyroxene.

Mineralogy

Olivine: The composition of olivine is Fo_{70-65} (ave. Fo_{66}).

Pyroxene: The pyroxene composition of 12043 is given in Baldridge et al. (1979)(figure 2).

Plagioclase: The composition of plagioclase is An_{78-88} (ave. An_{84}).

Metallic iron: Found attached to chromite.

Mineralogical Mode for 12043

	Neal et al. 1994	Baldridge et al. 1979
Olivine	0.9	0.9
Pyroxene	57.7	57.7
Plagioclase	32.9	32.9
Ilmenite	3.5	3.5
Chromite +Usp	0.2	0.3
mesostasis	0.8	0.6
“silica”	3.7	3.7

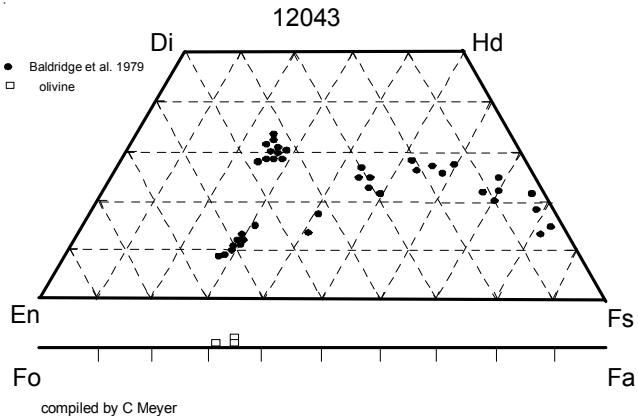


Figure 2: Composition of pyroxene in 12043 (from Baldridge et al. 1979).

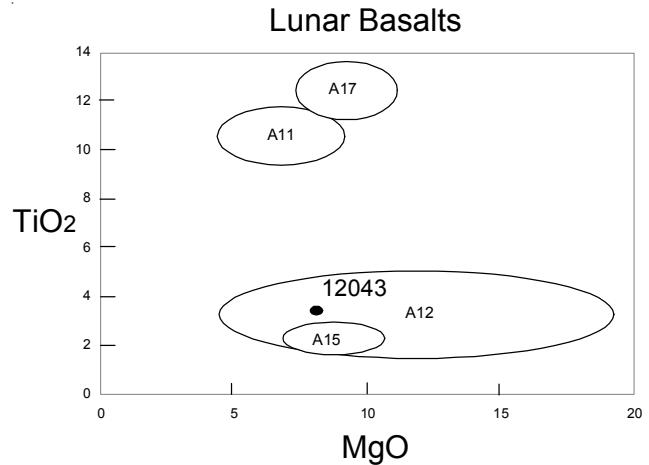


Figure 3: Composition of 12043 compared with that of other lunar basalts.

Chemistry

Rhodes et al. (1977) and Snyder et al. (1997) determined the chemical composition of 12038 (table 1 and figures 3 and 4).

Radiogenic age dating

Not dated.

List of Photo #s for 12043

S69-61562 – 61585
S69-63823 – 63826
S70-22460 – 22467
S94-035810

B & W mug

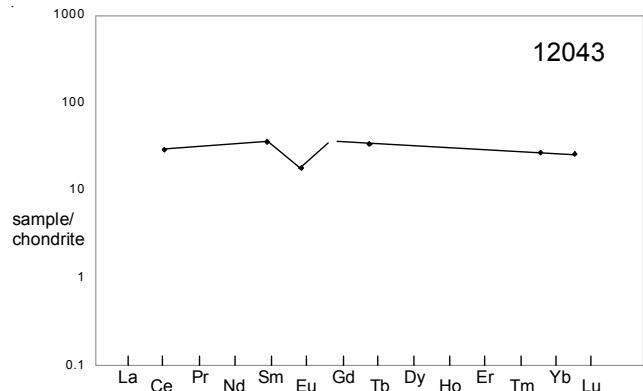


Figure 4: Normalized rare-earth-element pattern for 12043 (data from table).

Table 1. Chemical composition of 12043.

reference Rhodes77 Baldridge79 Snyder97

weight

SiO ₂ %	46.77	(c)	47.11	(d)	46.8
TiO ₂	3.38	(c)	3.39		3.38
Al ₂ O ₃	10.09	(c)	10.56		10.1
FeO	19.5	(c)	19.52		19.5
MnO	0.29	(c)	0.25		0.29
MgO	7.68	(c)	7.9		7.68
CaO	10.96	(c)	11.15		11
Na ₂ O	0.27	(a)	0.27		0.27
K ₂ O	0.06	(c)	0.02		0.06
P ₂ O ₅	0.06	(c)	0.06		0.06
S %	0.07	(c)	0.11		

sum

Sc ppm 52.4 (a)

V

Cr	3300	(a)	2270	(e)
Co	37	(a)	36.4	(e)
Ni			18.2	(e)
Cu			10.1	(e)
Zn			9.02	(e)
Ga			3.15	(e)

Ge ppb

As

Se

Rb			2.497	(e)
Sr	117	(c)	117.2	(e)
Y	40	(c)	42.1	(e)
Zr	123	(c)	125	(e)
Nb	7.5	(c)	6.85	(e)

Mo

Ru

Rh

Pd ppb

Ag ppb			150	(e)
Cd ppb				
In ppb				
Sn ppb				
Sb ppb				

Te ppb

Cs ppm			0.159	(e)
Ba	73	(b)	69.2	(e)
La			6	(e)
Ce	17.7	(a)	16.2	(e)
Pr			2.58	(e)

Nd

Sm	5.25	(a)	5.15	(e)
Eu	1	(a)	0.93	(e)
Gd			5.47	(e)
Tb	1.25	(a)	1.03	(e)

Dy

Ho			1.42	(e)
Er			3.96	(e)
Tm			0.57	(e)
Yb	4.4	(a)	3.9	(e)

Lu	0.63	(a)	0.51	(e)
Hf	4	(a)		
Ta			0.355	(e)

W ppb

Re ppb

Os ppb

Ir ppb

Pt ppb

Au ppb

Th ppm			0.85	(e)
U ppm			0.258	(e)

technique: (a) INAA, (b) IDMS, (c) XRF, (d) from mode, (e) ICP-MS