Reference List

NWA7032 – 85 grams
NWA7272 - 58.7 grams
Depleted microgabbric Shergottite

DRAFT

Figure 1: *Photo of NWA7032 showing fusion crust (from Irving 2012). width = 5 cm*

Introduction

NWA7032 is a relatively coarse-grained shergottite found in southern Morocco in 2011 (Meteoritical Bulletin). It has a fusion crust on one side and a broken surface on the other – there may be more of it (figure 1).

Petrography

Irving et al. (2011) give a brief description. The grain size is about 1 mm and the minerals are relatively homogenous (*chemically unzoned*). The texture is unique for Martian meteorites. It is equigranular (figures 2 – 4). The sample is rich in olivine and pyroxene both pigeonite and augite. Plagioclase has been completely converted to water-clear maskelynite, which contains some vapor bubbles. Accessory

Mineralogical Mode of NWA7032

	Irving et al. 2012
Olivine	40 vol. %
Pyroxene	35
Plagioclase	20

Figure 2: *Photo of broken surface of NWA7032 showing coarse grain size (from Irving et al. 2012). width = 5 cm.*

minerals are chromite, ilmenite, pyrrhotite and rare-merrillite.

Mineralogy

Olivine: Olivine is Fo_{54}.

Pyroxene: Two relatively homogeneous pyroxenes are present. Pigeonite is ~$Wo_{16}En_{57}$, augite is ~$Wo_{25}En_{51}$ (Irving et al. 2012).

Plagioclase: Plagioclase is maskelynite An_{60}.

Chemistry

Irving et al. (2012) report some chemistry. Note slight Eu anomaly (figure 5).

Radiogenic age dating

Not yet

Cosmogenic isotopes and exposure ages

Not yet.

Figure 3: *Photo of interior of NWA7032 (from internet).*

Processing
NWA7272 is paired (unofficial)

References for NWA7032

Figure 4: *Photo of new slab cut from NWA7032 (from internet).*

Other Studies
Oxygen isotopes are reported by Irving et al. (2012).
Delta ^{17}O is 0.26 ‰.

Table 1. Chemical composition of 7032.

reference	Irving12	
weight		
SiO2 %		
TiO2		
Al2O3		
FeO		
MnO		
MgO		
CaO		
Na2O		
K2O		
P2O5		
S %		
sum		
Sc ppm		
V		
Cr		
Co		
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	0.54	(b)
Ce	1.91	(b)
Pr	0.43	(b)
Nd	4.05	(b)
Sm	2.66	(b)
Eu	0.86	(b)
Gd	5.37	(b)
Tb	0.98	(b)
Dy	6.24	(b)
Ho	1.29	(b)
Er	3.63	(b)
Tm	0.49	(b)
Yb	2.91	(b)
Lu	0.42	(b)
Hf	1.75	(b)
Ta		
W ppb		
Re ppb		
Os ppb		
Ir ppb		
Pt ppb		
Au ppb		
Th ppm		
U ppm		

technique: (a) XRF (b) ICP-MS

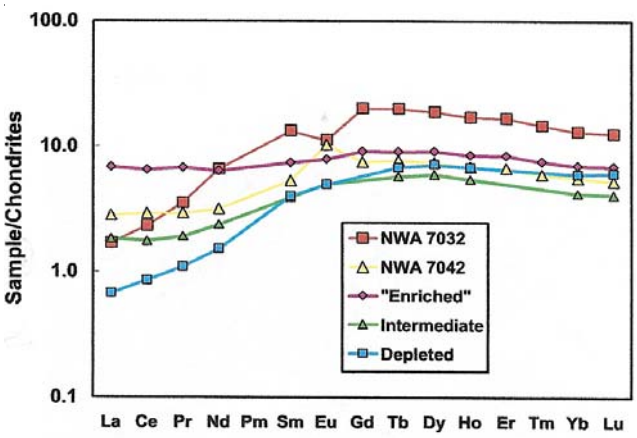

Figure 5: *Normalized rare-earth-element diagram for NWA7032 (and 7042) compared with the three kinds of shergottites (Irving et al. 2012).*