

NWA7032 – 85 grams
NWA7272 - 58.7 grams
Depleted microgabbritic 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

Mineralogical Mode of NWA7032

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

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



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_{34} .

Pyroxene: Two relatively homogeneous pyroxenes are present. Pigeonite is $\sim\text{Wo}_{16}\text{En}_{57}$, augite is $\sim\text{Wo}_{25}\text{En}_{51}$ (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

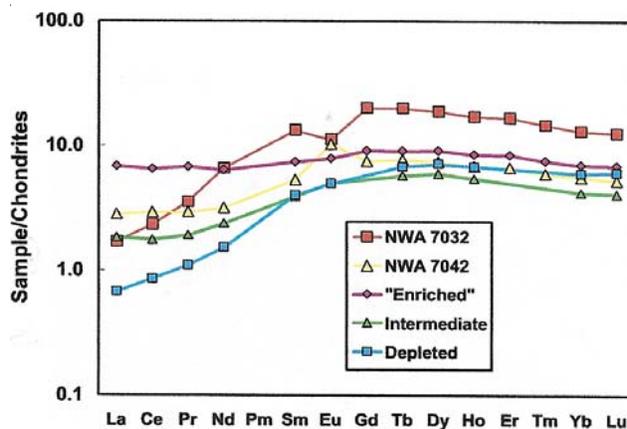


Figure 5: Normalized rare-earth-element diagram for NWA7032 (and 7042) compared with the three kinds of shergottites (Irving et al. 2012).