

DRAFT

NWA4468

Olivine, Opx-phyric Basaltic Shergottite
675 grams



Figure 1: Thumbnail picture of slice of NWA4468 (found using Google).

Introduction

Hupe (2006) describe the acquisition of a large, round basaltic shergottite with complete fusion crust.

Chemistry

Irving et al. give the composition (table and figure 2).

Petrography

NWA4468 is described by Irving *et al.* (2007) and made official by Connolly H.C. *et al.* (2007).

Radiogenic age dating

Borg et al. (2008) report a Sm/Nd isochron age of ~150 m.y.

Large pyroxene oikocrysts (0.2 x 1 cm), surrounding olivine and chromite grains, are set in an interstitial matrix of olivine, pyroxene, plagioclase opaque minerals and phosphates (figure 1). Olivine centers (Fo_{71}) zone to more Fe-rich. Orthopyroxene cores ($\text{Wo}_{4.4}\text{En}_{71}$) zone to sub-calcic augite ($\text{W}_{33}\text{En}_{48}$).

Large melt inclusions, found in olivine, contain K-rich minerals.

Mineralogical Mode for NWA4468

Irving et al. 2007

Olivine	35 %
Pyroxene	30
Plagioclase	25
Chromite	
Ilmenite	
Merrillite	
cl-apatite	
pyrrhotite	

Table 1. Chemical composition of NWA4468.

reference Irving 2007

weight

SiO₂ %

TiO₂

Al₂O₃

FeO 23

MnO

MgO

CaO

Na₂O 1.09

K₂O

P₂O₅

S %

sum

Sc ppm 25.6

V

Cr 5780

Co 72.4

Ni 325

Cu

Zn 75

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 0.27

Ba

La 1.92

Ce 5.1

Pr

Nd

Sm 1.06

Eu 0.42

Gd

Tb 0.32

Dy

Ho

Er

Tm

Yb 1.13

Lu 0.17

Hf 1.5

Ta

W ppb

Re ppb

Os ppb

Ir ppb

Pt ppb

Au ppb

Th ppm 0.32

U ppm

technique: (a) INAA

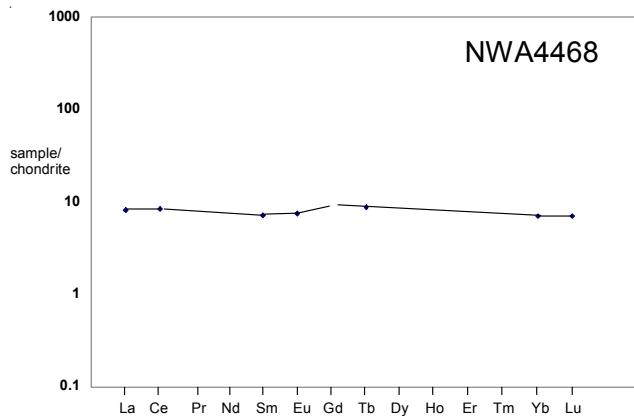


Figure 2: Normalized rare-earth-element diagram for NWA4468.

References for NWA4468

Borg L.E., Gaffney A.M. and DePaolo D. (2008) Preliminary age of Martian meteorite Northwest Africa 4468 and its relationship to the other incompatible-element-enriched shergottites (abs#1851). *Lunar Planet. Sci. XXXIX* Lunar Planetary Institute, Houston.

Connolly H.C. and 9 authors (2007) The Meteoritical Bulletin, No. 91, 2007 March. *Meteoritics & Plan. Sci.* **42**, 413-466.

Irving A.J., Kuehner S.M., Korotev R.L. and Hupe G.M. (2007) Petrology and bulk composition of primitive enriched olivine basaltic shergottite Northwest Africa 4468 (abs#1526).

Lunar Planet. Sci. XXXVII Lunar Planet. Institute, Houston.

Hupe G.M. (2006) *Meteorite* 12, 24-29.