Reference List

NWA 4925 – 282 grams
NWA 4527 – 10 grams
Depleted Olivine-phyric Shergottite

Figure 1: *Photo of whole rock NWA 4925 stone(photo by S Ralew). Note corner where 4527 was cut from.*

Introduction

NWA4527 (figure 2) was cut from the corner of NWA4925 (figure 1) and studied first (Nishiizumi et al. 2011). The sample had a thick weathering rind and long terrestrial residence time (420-490 k.y.)(figure 3).

Petrography

According to the description by Greshake in the Meteoritical Bulletin, NWA4925 displays a porphritic texture with large chemically zoned olivine megacrysts set into a fine-grained groundmass composed of pyroxene and maskelynite. Minor phases include chromite, sulfides, phosphates and small Fe-rich olivines. The olivine megacrysts contain magmatic melt inclusions and small chromites.

NWA4925 contains shock-melted pockets.

Figure 2: *Photo of NWA4527 (from Classon).*

Mineralogy

Olivine: Olivine is $Fa_{27.6-46.8}$

Pyroxene: Pyroxene is $Fs_{20-38}Wo_{3-15}$

Plagioclase: Plagioclase is maskelynite An_{67-69}

Figure 3: *Photo of sawn surface of NWA4925 (photo by S. Ralew).*

Chemistry

Kuehner et al. (2011) reported the chemical composition of NWA4925 (table 1, figure 4).

Radiogenic age dating

Not yet

Cosmogenic isotopes and exposure ages

NWA4925 has a terrestrial age of 420-490 k.y. and 0.6-0.73 m.y. exposure age so it left Mars 1.1 m.y. ago. (Nishiizumi et al. 2011).

Other Studies

Rumble and Irving (2009) reported the oxygen isotope composition (Delta ^{17}O = 0.23 ‰).

Processing

A corner was cut from NWA4925 and studied first as NWA4527 (figures 1 and 2). Looking at what's on the internet, I'd say the rocks been cut into thin slices (figure 5).

References for NWA4925 and 4527

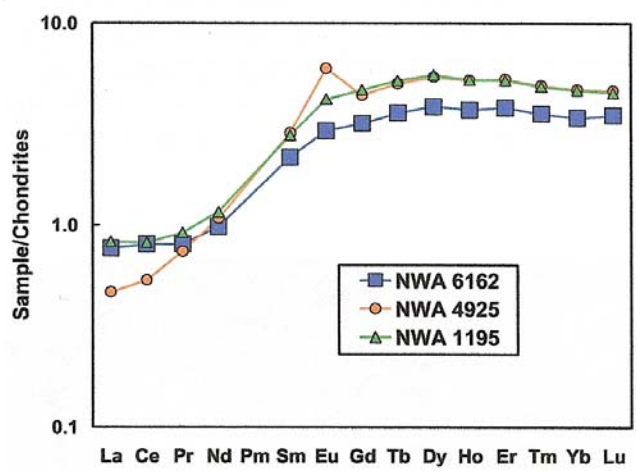

Figure 4: *Normalized rare-earth-element diagram for NWA4925 compared with "depleted" shergottites (from Kuehner et al. 2011).*

Figure 5: Thin slice of NWA4925 (from internet site).

Table 1. Chemical composition of 4925.

reference	Kuehner11	
weight		
SiO2 %	44.53	(a)
TiO2	0.78	(a)
Al2O3	4.77	(a)
FeO	16.7	(a)
MnO	0.51	(a)
MgO	15.9	(a)
CaO	6.52	(a)
Na2O	0.88	(a)
K2O	0.06	(a)
P2O5	0.82	(a)
S %		
sum		
Sc ppm		
V		
Cr	4310	(a)
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	0.15	(b)
Ce	0.44	(b)
Pr	0.09	(b)
Nd	0.66	(b)
Sm	0.57	(b)
Eu	0.46	(b)
Gd	1.18	(b)
Tb	0.25	(b)
Dy	1.79	(b)
Ho	0.4	(b)
Er	1.14	(b)
Tm	0.16	(b)
Yb	1.04	(b)
Lu	0.15	(b)
Hf		
Ta		
W ppb		
Re ppb		
Os ppb		
Ir ppb		
Pt ppb		
Au ppb		
Th ppm		
U ppm		

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