

Northwest Africa 5207

Polymict fragmental breccia

101 g



Figure 1: Chips of NWA 5207 with 1 mm scale bars below (photo courtesy of R. Korotev).

Introduction

Northwest Africa 5207 was found in 2007, and consists of a 101 g stone (Weisberg et al., 2008). The interior weathering grade is very low.

Petrography, mineralogy, and chemistry

The fragmental matrix consists of lithic, glassy, and shocked components. The lithic fragments include plagioclase-olivine orthocumulates (olivine, $Fa_{26.5}$ ($FeO/MnO = 96$) and plagioclase, $An_{99.3}$), recrystallized noritic and troctolitic anorthosites, anorthosites, gabbros and coarse to fine-grained basalts (course: (olivine is Fa_{30} ; Ca-pyroxene core, $Fs_{45.1}Wo_{30.4}$ and rim, $Fs_{62.7}Wo_{16.8}$; plagioclase, $An_{87.7}$); fine: $Fa_{56.9}$ ($FeO/MnO = 93$); Ca-pyroxene, $Fs_{28.5}Wo_{34.7}$; plagioclase, $An_{91.2}$), microbreccias, shock-melted lithologies, symplectites (from pyroxferroite decomposition). And there are some glasses that resemble Apollo “green glasses” with irregular-shaped light to dark green glasses (B). Some of these are vesicular and contain tiny metal-sulfide spherules (Weisberg et al., 2008). The composition of the Green glasses (B) in wt %: $SiO_2 = 43.8$; $Al_2O_3 = 18.7$; $Cr_2O_3 = 0.50$; $TiO_2 = 0.78$; $FeO = 12.5$; $MgO = 7.0$; $CaO = 15.2$; $K_2O = 0.33$ and $Na_2O = 0.58$ (N = 17). Bulk compositional data indicate that $Na_2O = 0.484$ wt %; Sc = 15.52 ppm; Cr = 1065 ppm; $FeO = 7.56$ wt %; Co = 26.7 ppm; Ni = 233 ppm; Th = 1.26 ppm and Ba = 123 ppm (Weisberg et al., 2008; Korotev et al., 2009a,b), and that this sample is somewhat more enriched in REE and alkalis, but lower in Sc than the NWA 2995 pairing group (Fig. 2).

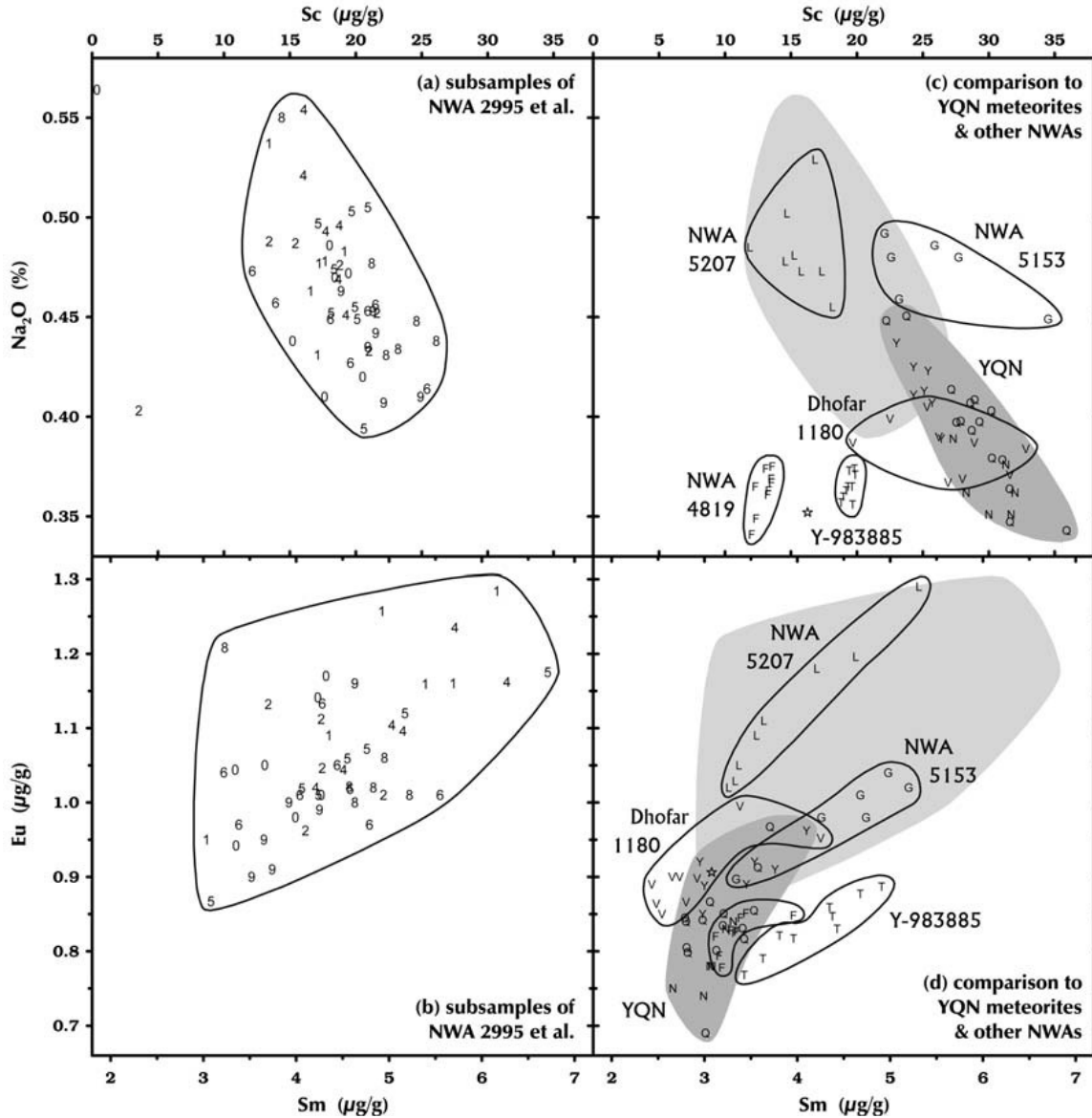


Figure 2: comparison of NWA 5207 bulk composition to other polymict lunar meteorite breccias, illustrating its distinct composition with slightly higher alkalis and REE compared to the YQN pairing group (Yamato, QUE, NWA 2995 pairs; Korotev et al., 2009b).

Radiogenic age dating and Cosmogenic isotopes and exposure ages

None yet reported.

Table 1a: Chemical composition of NWA 5207

<i>reference</i>	1	1	Ru	
<i>weight</i>	20-60	255	Rh	
<i>technique</i>	a	c	Pd ppb	
SiO ₂ %	44.5		Ag ppb	
TiO ₂	0.61		Cd ppb	
Al ₂ O ₃	23.3		In ppb	
FeO	7.56	7.56	Sn ppb	
MnO	0.11		Sb ppb	
MgO	7.5		Te ppb	
CaO	13.9	14.9	Cs ppm	0.09
Na ₂ O	0.48	0.484	Ba	123
K ₂ O	0.1	0.1	La	8.39
P ₂ O ₅	0.13		Ce	21.9
S %			Pr	
sum	98.3		Nd	12.4
			Sm	3.92
			Eu	1.12
			Gd	
			Tb	0.77
			Dy	
			Ho	
Sc ppm		15.52	Er	
V			Tm	
Cr		1065	Yb	2.71
Co		26.7	Lu	0.376
Ni		233	Hf	2.87
Cu			Ta	7.2
Zn			W ppb	
Ga			Re ppb	
Ge			Os ppb	
As		<1	Ir ppb	4.3
Se		<1.2	Pt ppb	
Rb		<6	Au ppb	1.26
Sr		165	Th ppm	0.35
Y			U ppm	7.2
Zr		111		
Nb				
Mo				

technique (a) EMPA, (b) ICP-MS, (c) INAA (d) XRF

**Table 1b. Light and/or volatile elements for NWA
5207**

Li ppm

Be

C

S

F ppm

Cl

Br

0.49

I

Pb ppm

Hg ppb

Tl

Bi

References: 1) Korotev et al. (2009b)

K. Righter – Lunar Meteorite Compendium - 2010