Dhofar 1442

Polymict regolith breccia

106.5 g

Figure 1: Slice through Dhofar 1442 with 1 mm scale bars below (photo courtesy of R. Korotev).

Introduction

Dhofar 1442 was found in 2005 in Oman, and consists of five separate stones weighing a total of 106.5 g; none of these stones have fusion crust. Weathering products are present, but minor (Weisberg et al., 2009). The diversity of clast lithologies and the presence of glassy spherules makes this rock a regolith breccias.

Petrography, mineralogy, and chemistry

The lithic clasts present in Dho 1442 include anorthosites, gabbros, olivine gabbronorites, gabbronorites, and norites. Clast size is between 0.02 to 8 mm. Major minerals among the fragments are pyroxene and feldspar, with minor olivine, silica, chromite, ilmenite, Ca-phosphate, troilite and FeNi metal also present23.6 wt%). and troilite, as well as a large amount of pyroxene (Weisberg et al., 2009). Geochemical analysis of Dhofar 1442 indicate it has high concentrations of alkalies and phosphorus (Na_2O 0.88; K_2O 0.76; P_2O_5 0.84), and may be one of the few polymict breccias that contain a large KREEP component (Weisberg et al., 2009; Korotev et al., 2009).

Radiogenic age dating and Cosmogenic isotopes and exposure ages

None yet reported.

Table 1a:Chemical composition of Dhofar 1442

reference	1
weight	298
technique	c
SiO_2 %	
TiO_2	
Al_2O_3	
FeO	13.56
MnO	
MgO	
CaO	11.9
Na_2O	0.791
K_2O	0.68
P_2O_5	
S %	
sum	
Sc ppm	31.1
V	
Cr	1638
Co	43.4
Ni	540
Cu	
Zn	
Ga	
Ge	
As	0.2
Se	0.5
Rb	16
Sr	1200
Y	
Zr	1190
Nb	
Mo	
Ru	
Rh	
Pd ppb	
Ag ppb	
Cd ppb	
In ppb	
Sn ppb	
Sb ppb	
Te ppb	
Cs ppm	0.74
Ba	900
La	82.7
Ce	217
Pr	
Nd	123
Sm	38
Eu	2.62
Gd	
Tb	7.69
Dy	
Ho	
Er	
Tm	
Yb	27.3
Lu	3.71
Hf	29.5
Ta	3.71
W ppb	
Re ppb	
Os ppb	
Ir ppb	22
Pt ppb	
Au ppb	9
Th ppm	14.4
U ppm	4

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

Table 1b. Light and/or volatile elements for Dhofar 1442

Li ppm		
Be		
C		
S		
F ppm		
Cl		
Br	0.6	
I		
Pb ppm		
Hg ppb		
Tl		
Bi		

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