

65016
Large Glass Object
21 grams



Figure 1: Photo of large hollow glass object, 65016. Cube is 1 cm. NASA S72-39399.

Introduction

65016 is a hollow, broken sphere or glass bubble (figure 1). It is about 3 – 4 cm in size. The glass surface is smooth and without zap pits. The glass has a green color.

Petrography

Schaal et al. (1979) and Ryder and Norman (1980) provide brief descriptions. Glass object 65016 is all glass except where some microlites are growing adjacent to nucleation centers around included feldspar (figure 2). It has a smooth outer surface lacking micrometeorite pits.

Chemistry

Ganapathy et al. (1974), Morris et al. (1986) and See et al. (1986) determined the composition (table 1) which is rather like local soil (figure 3). Hertogen et al. (1977) assign 65016, 60095 and the glass coat of 64455 to meteorite group 5H and conclude that these

fresh glasses probably represent impact melt produced by South Ray Crater.

Other Studies

Uhlmann et al. (1974, 1977, 1978) and Klein and Uhlmann (1976) did experiments and calculations on glass from 65016 and synthetic analog to calculate the cooling rate required to avoid recrystallization (2×10^3 deg C/min). They determined the liquidus temperature as 1360 deg C.

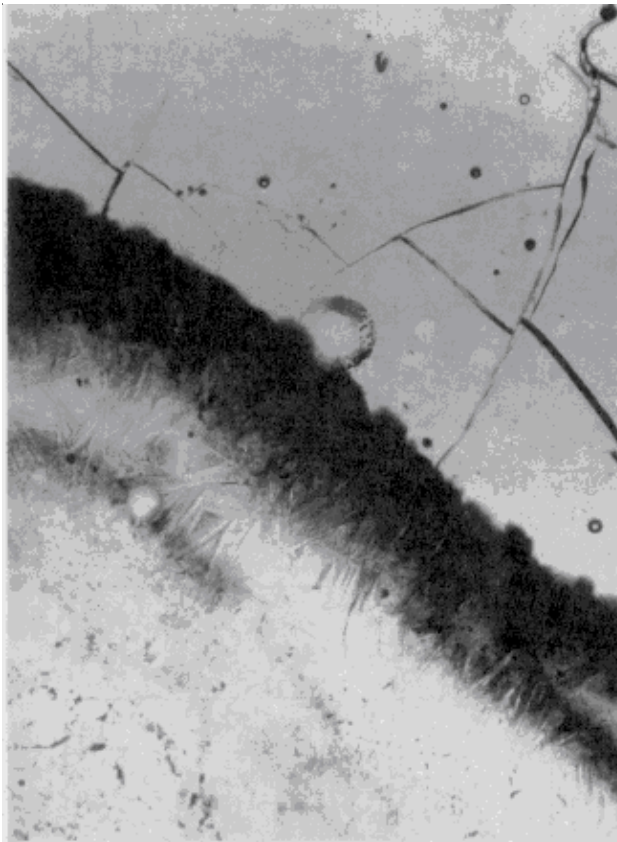


Figure 2: Thin section photo of glass at boundary with anorthosite inclusion showing devitrification of glass. Field of view 2 mm. (from Ryder and Norman 1980)

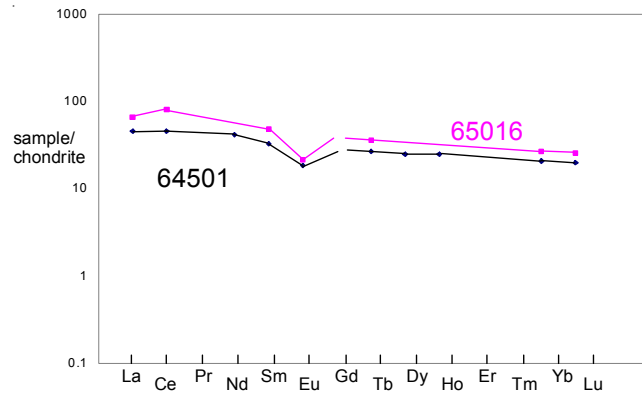


Figure 3: Normalized rare-earth-element pattern for 65016 glass object (Morris et al. 1986) and for soil 64501 (Papike et al. 1982).

References for 65016

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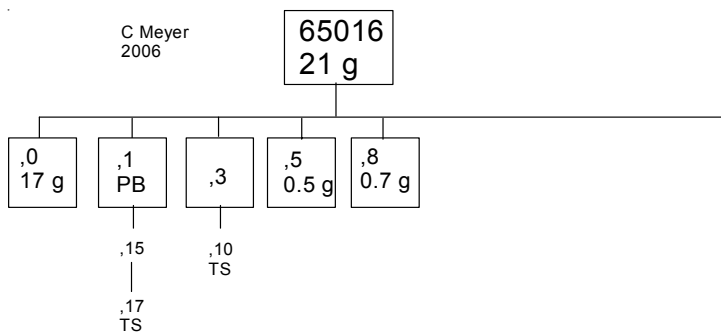


Table 1. Chemical composition of 65016.

reference weight	Uhlmann 77	Ganapathy74	Morris86	
SiO2 %	44.2		44.7	(d)
TiO2	0.6		0.48	(d)
Al2O3	26.5		26.56	(d)
FeO	5.5		5.06	(d)
MnO				
MgO	7.3		7.15	(d)
CaO	15.3		15.35	(d)
Na2O	0.4		0.26	(d)
K2O	0.1		0.08	(d)
P2O5				
S %				
sum				
Sc ppm			6.77	(c)
V				
Cr			745	(c)
Co			43	(c)
Ni		532	(b) 566	(c)
Cu				
Zn		0.52	(b)	
Ga				
Ge ppb		225	(b)	
As				
Se		96	(b)	
Rb		1.44	(b)	
Sr				
Y				
Zr				
Nb				
Mo				
Ru				
Rh				
Pd ppb				
Ag ppb		0.59	(b)	
Cd ppb		1.5	(b)	
In ppb				
Sn ppb				
Sb ppb		1.66	(b)	
Te ppb		12.8	(b)	
Cs ppm		0.062	(b)	
Ba			146	(c)
La			15.6	(c)
Ce			48.9	(c)
Pr				
Nd				
Sm			7.16	(c)
Eu			1.21	(c)
Gd				
Tb			1.32	(c)
Dy				
Ho				
Er				
Tm				
Yb			4.4	(c)
Lu			0.64	(c)
Hf			4.6	(c)
Ta			0.56	(c)
W ppb				
Re ppb		2.29	(b)	
Os ppb				
Ir ppb		26.3	(b)	
Pt ppb				
Au ppb		7.19	(b)	
Th ppm			2.9	(c)
U ppm		0.65	(b) 0.54	(c)

technique: (a) emp, (b) RNAA, (c) INAA

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