

14179
Breccia with clasts
3.03 grams



Figure 1: Photo of 14179. Sample is 1.8 cm long. S71-26890.

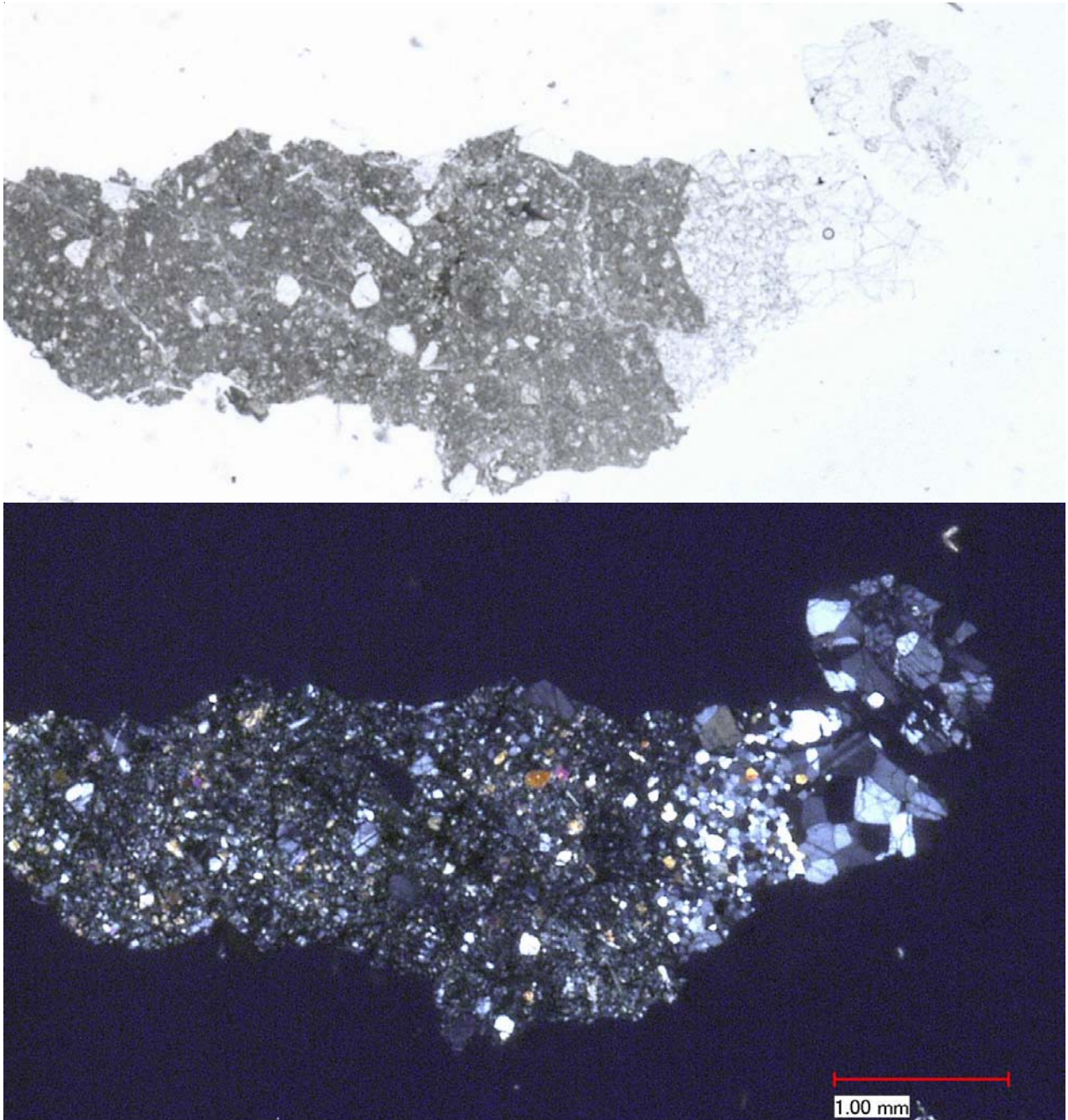


Figure 2: Photomicrographs of 14179,12 by C Meyer @ 50x (bottom is with crossed polarizers).

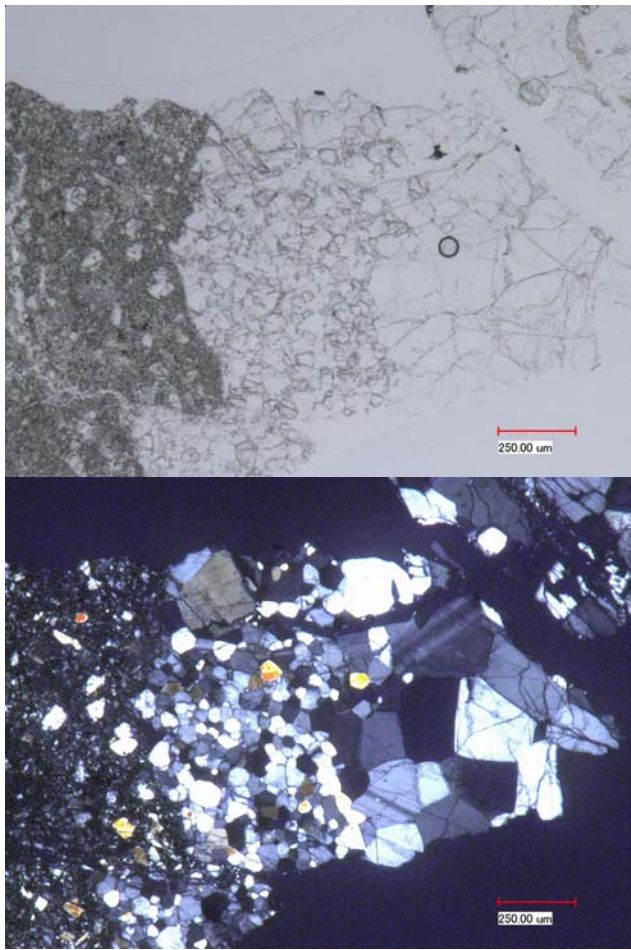


Figure 3: Photomicrographs of 14179,12 by C Meyer @ 150x.

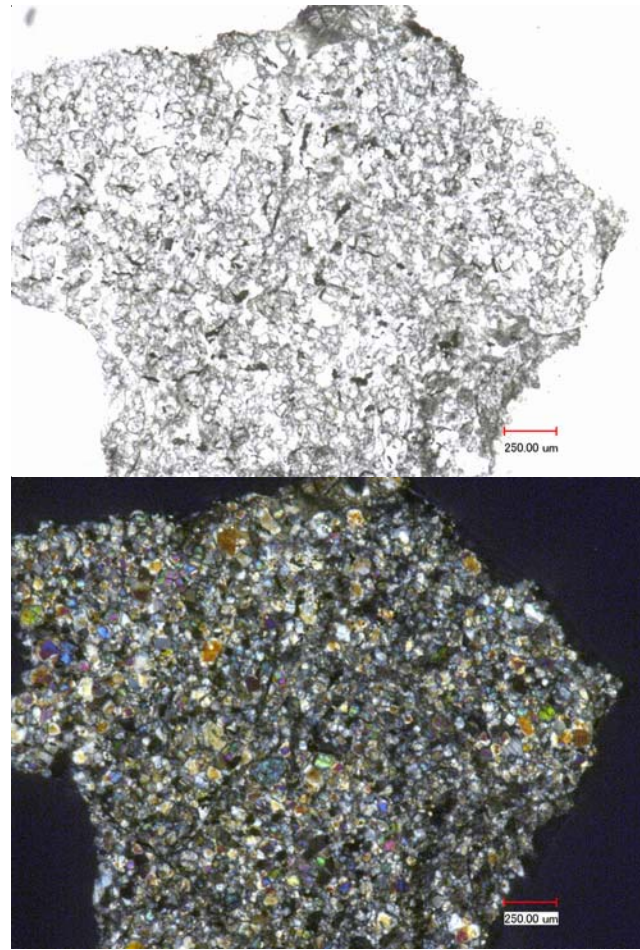


Figure 4: Photomicrographs of 14179,4 by C Meyer @ 100x.

Introduction

14179 was either collected as a grab sample from the comprehensive sample area (Sutton et al. 1971) or it is a piece broken off of large breccias samples 14303 or 14305 returned in the same bag (Phinney et al. 1975). Two clasts from 14179 have been studied.

Petrography

Although Warren and others reported 14179 as a troctolite or other, it appears that most of 14179 is a crystalline matrix breccia (figures 1 and 2). Figure 3 shows an “anorthosite” clast while figure 4 shows a clast of “troctolitic granulite”. Warren et al. explain that their troctolite clast (60% plagioclase, 40% olivine) may be related to a similar clast from 14303. Plagioclase is An_{94} and olivine is Fo_{87} .

Chemistry

Warren et al. (1981) give an analysis of the troctolite clast (table 1), along with a lot of discussion.

Radiogenic age dating

Stadermann et al. (1991) (figure 5) determined an Ar/Ar plateau age of 3.97 ± 0.01 b.y. for a granulite clast – possibly the troctolite clast of Warren et al.

Cosmogenic isotopes and exposure ages

Stadermann et al. (1991) determined a cosmic-ray exposure age of 35 m.y. by the ^{38}Ar method.

Table 1. Chemical composition of 14179.

reference weight	Warren81	
SiO ₂ %	42.6	(a)
TiO ₂	0.28	(a)
Al ₂ O ₃	22.9	(a)
FeO	4.44	(a)
MnO	0.05	(a)
MgO	16	(a)
CaO	12.5	(a)
Na ₂ O	0.38	(a)
K ₂ O	0.08	(a)
P ₂ O ₅		
S %		
sum		
Sc ppm	4.23	(a)
V		
Cr	303	(a)
Co	25	(a)
Ni	66	(a)
Cu		
Zn	0.94	(a)
Ga		
Ge ppb	16	(a)
As		
Se		
Rb		
Sr		
Y		
Zr	310	(a)
Nb		
Mo		
Ru		
Rh		
Pd ppb		
Ag ppb		
Cd ppb		
In ppb		
Sn ppb		
Sb ppb		
Te ppb		
Cs ppm		
Ba	260	(a)
La	33.2	(a)
Ce	82	(a)
Pr		
Nd	52	(a)
Sm	13.8	(a)
Eu	2.1	(a)
Gd		
Tb	2.6	(a)
Dy	15.7	(a)
Ho		
Er		
Tm		
Yb	8.3	(a)
Lu	1.17	(a)
Hf	5.9	(a)
Ta	0.57	(a)
W ppb		
Re ppb	0.026	(a)
Os ppb		
Ir ppb	0.14	(a)
Pt ppb		
Au ppb	0.22	(a)
Th ppm	3.7	(a)
U ppm	0.78	(a)

technique: (a) INAA

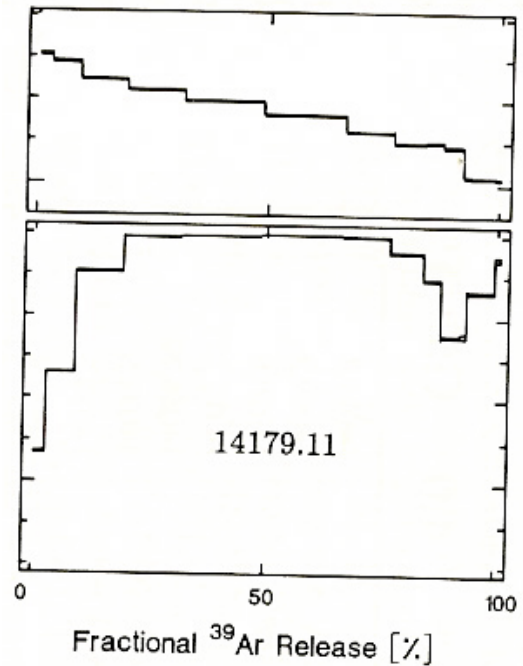
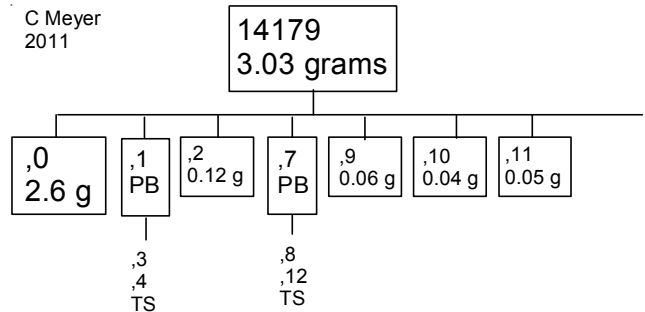


Figure 5: Ar plateau diagram for granulite clast in 14179 (Stadermann et al. 1991).



References for 14179

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