Content

Certificate information

Object for sertification is a polished fragment of Chinga meteorite with daubréelite-troilite lamellar aggregates.

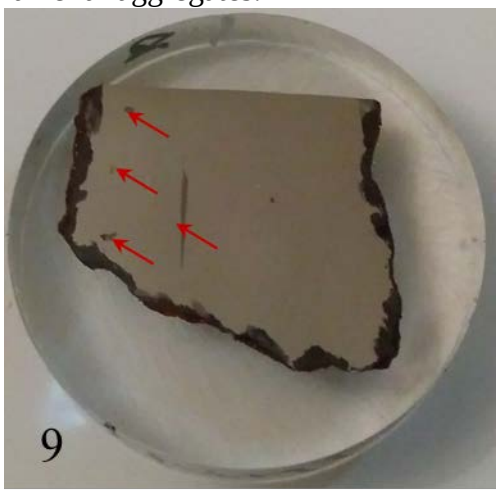

Fig.1. Photo of certified specimen.

Similar polished tablet from the same meteorite fragment stored in scientific collection of Fersman Mineralogical Museum (number FMM_FN174).

This certificate was written by Pavel Plechov from Fersman Mineralogical Museum. Original version of the certificate could be downloaded from Fersman Mineralogical Museum WWW-server (File FMM_Certificate_2018-33-9).

Results

Iron meteorite Chinga was classified as ataxite IVB with bulk composition (in wt.%): Fe -82,8, Ni - 16,6, Co - 0,55, P - 0,05 [Schaudy et al.,1972]. The main mineral in the Chinga meteorite is plessite.

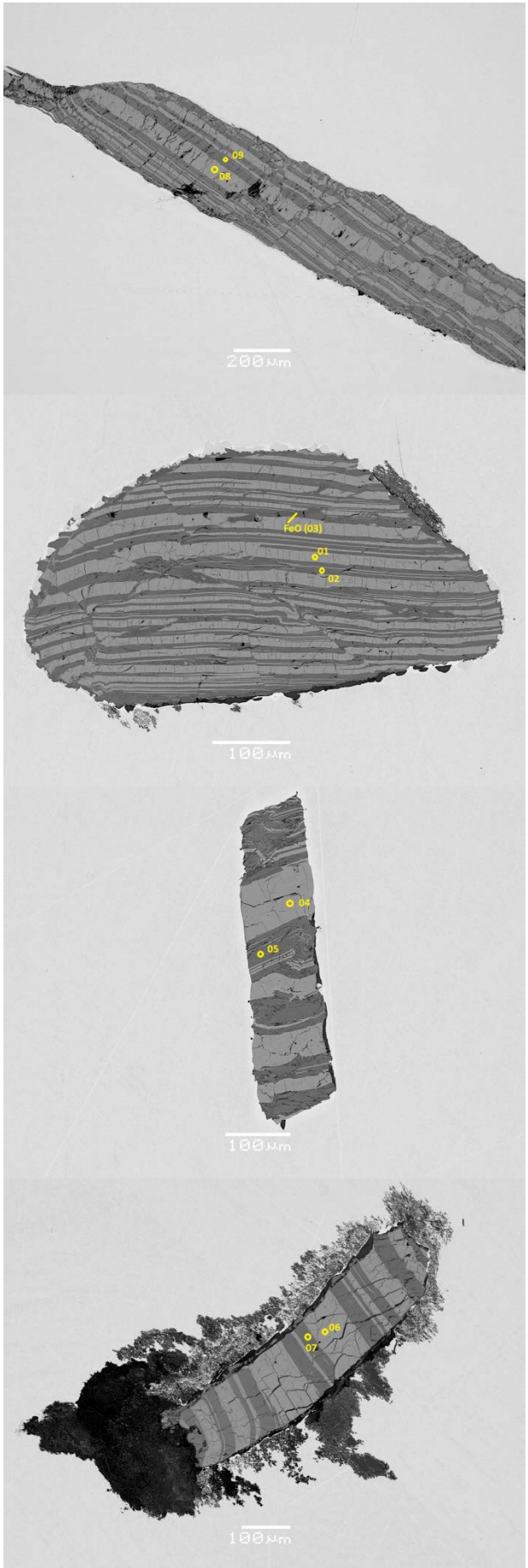

Fig.2 Daubreelite-troilite lamellar aggregates in plessite matrix.

Table 1. Microprobe analyses in studied spacemen

No	Phase	Fe	Mn	Cr	Ni	Co	V	S	Total
1	Troilite	61.41	b.d.l.	1.41	b.d.l.	0.32	0.45	36.25	99.84
2	Daubreelite	19.64	0.59	35.05	b.d.l.	b.d.l.	b.d.l.	43.48	98.76
3	Schreibersite	66.61	b.d.l.	0.94	b.d.l.	b.d.l.	b.d.l.	0.22	67.77
4	Troilite	61.3	b.d.l.	0.99	0.37	0.25	0.45	36.13	99.49
5	Daubreelite	18.98	0.53	35.35	b.d.l.	b.d.l.	b.d.l.	43.57	98.43
6	Troilite	61.31	b.d.l.	1.11	b.d.l.	0.33	0.41	36.27	99.43
7	Daubreelite	19.02	0.72	35.08	b.d.l.	b.d.l.	b.d.l.	43.78	98.6
8	Troilite	61.16	b.d.l.	1.23	0.13	0.3	0.35	36.16	99.33
9	Daubreelite	19.11	0.46	35.65	b.d.l.	b.d.l.	b.d.l.	44.03	99.25

Comments: all values in wt.% of elements, b.d.l. – below detection limit

This spacemen is extremely rich in large daubreelite-troilite lamellar aggregates. Four largest of them are shown by red arrows in Fig.1. All daubréelite-troilite aggregates are well distinguishable by the eyes. Largest aggregate has elongated shape, approximately 6 mm length and 0.3-0.4 mm width.

Daubreelite analyses correspond in average to formulae

$$\mathbf{Fe_{1.01}Cr_{1.99}S_4}$$

Two analyses have ideal formulae of daubréelite ($FeCr_2S_4$) and analyse No.2 (thin ribbon of daubréelite in troilite) shows excess of Fe in formulae (0.04 f.u.). These daubréelite analyses contain small amounts of Mn (0.46-0.72 wt.% - see Tabl.1).

All troilite analyses correspond to formulae

$$\mathbf{Fe_{0.97}Cr_{0.02}S}$$

Impurity of Cr for troilite and excess of Fe in daubréelite are typical for daubréelite-troilite aggregates.

Literature

Buchner, E., Schmieder, M., Kurat, G., Brandstätter, F., Kramar, U., Ntaflos, T., & Kröchert, J. (2012). Buddha from space—An ancient object of art made of a Chinga iron meteorite fragment. Meteoritics & Planetary Science, 47(9), 1491-1501.

Schaudy, R., Watson, J. T., & Buchwald, V. F. (1972). The chemical classification of iron meteorites. VI. A reinvestigation of irons with Ge concentration lower than 1 ppm. Icarus, 17(1), 174-192.

Date: 2018, Apr 05