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Certificate information

Object for certification is a polished fragment of Chinga meteorite with daubreelite-troilite lamellar aggregates.

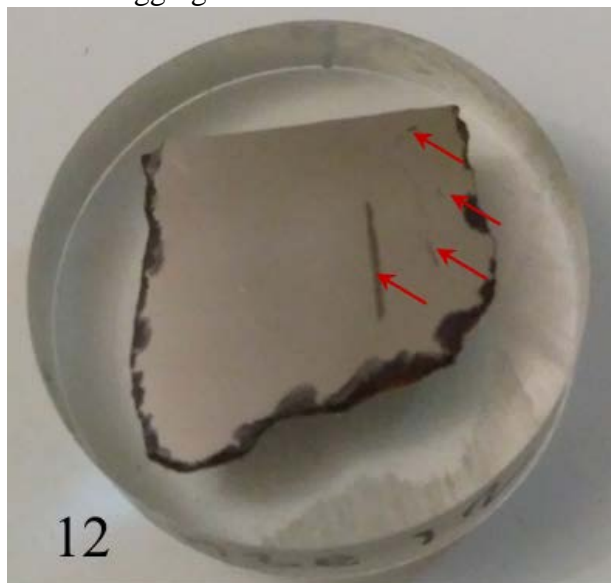


Fig.1. Photo of certified specimen.

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_2018-33-12).

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.

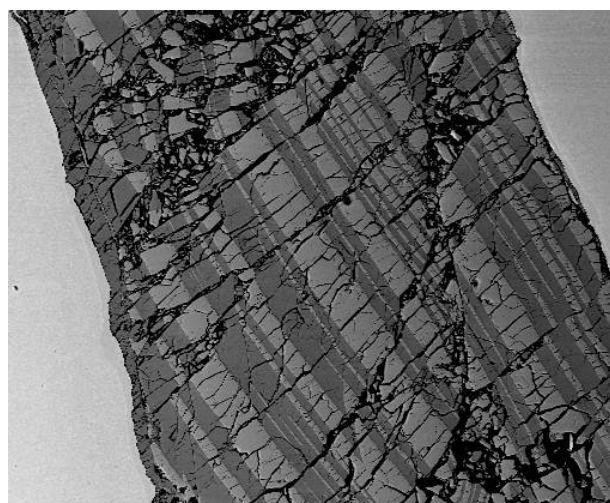


Fig.2 Daubreelite-troilite lamellar aggregates in plessite matrix.

This specimen is extremely rich in large daubreelite-troilite lamellar aggregates. Four largest of them are shown by red arrows in Fig.1. All daubreelite-troilite aggregates are well distinguishable by the eyes. Largest aggregate has elongated shape, approximately 3.5 mm length and 0.3-0.4 mm width.

Aggregates consist of very thin ribbons of troilite and daubreelite. It allows measure bulk composition of troilite-daubreelite aggregate by area (see first two analyses in the Tabl.1). Bulk composition of this aggregate could be recalculated to formulae of some primary (still unknown) mineral $Fe_5Cr_2S_8$. Decomposition of the primary mineral to daubreelite and troilite should reflect primary molar ratio 1:4 of these minerals in primary unknown mineral.

Table 1. Microprobe analyses in studied specimen

No	Phase	Fe	Mn	Cr	Ni	Co	V	S	Total
1	Area x600	42.42	0.35	15.45	0.28	0.18	0.37	38.96	98.01
3	Area x600	42.02	0.19	15.87	0.14	b.d.l.	0.33	38.68	97.23
4	Troilite	61.05	b.d.l.	1.26	b.d.l.	0.2	0.50	36.45	99.46
5	Daubreelite	19.23	0.61	35.54	b.d.l.	b.d.l.	b.d.l.	44.28	99.66
6	Troilite	60.37	b.d.l.	1.34	b.d.l.	0.23	0.48	36.56	98.98
7	Daubreelite	18.92	0.46	35.67	0.14	b.d.l.	b.d.l.	44.08	99.27

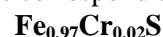
Comments: all values in wt.% of elements, b.d.l. – below detection limit, Area x600 – analyses of troilite-daubreelite aggregate by scanning of area with magnification 600x.

Daubreelite analyses correspond in average to formulae



These daubreelite analyses contain small amounts of Mn (0.46-0.61 wt.% - see Tabl.1).

All troilite analyses correspond to formulae



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., & Kröcher, 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 08