

**KABA, CV3 CHONDRITE: ORIENTED OVERALL TEXTURE AND REFRACTORY SPHERULE IN A NEW, LARGE SURFACE THIN SECTION.** *I. Kubovics<sup>1</sup>, K. Gál-Sólymos<sup>1</sup>, Sz. Bérczi<sup>1,2</sup>, Z. Ditrói-Puskás<sup>1</sup>, B. Nagy<sup>3</sup>*, <sup>1</sup>Eötvös University, Dept. Petrology and Geochemistry, H-1088 Budapest, Múzeum krt 4/a. Hungary, <sup>2</sup>Eötvös University, Dept. G. Technology, H-1088 Budapest, Rákóczi út 5. Hungary <sup>3</sup>Hungarian Academy of Sciences, Xth. Class Off., H-1055 Budapest, Nádor u. 7. Hungary, (berczisani@ludens.elte.hu).

**HISTORICAL.** Since its fall on 15<sup>th</sup> April, 1857, Kaba carbonaceous chondrite has been stored at the Reform Church College at Debrecen, Hajdú-Bihar County, Hungary. After more than 30 years of silencium a new thin section has been prepared and studied at the Eötvös University, Budapest. The new thin section has a larger surface, (ca. 7 cm<sup>2</sup>) than any earlier ones. EPMA studies were began on it, and the new studies proved again the great variability of the unequilibriumed textural components in the meteorite, of which we show an overview: the large surface textural map with regular and peculiar objects.

**INTRODUCTION.** The last general (and the first modern type) overall studies on KABA were carried out by Sztrókay et al. in 1961 [1]. Over the first modern petrographic description of KABA in this work they used X-ray identification of mineral components and they were who first found considerable amount of spinel in a carbonaceous chondrite.

During the last three decades there were great periods of enhanced interest to KABA.

- 1. at classification of carbonaceous chondrites [2-6],
- 2. at discovery of the presence of condensational sequence minerals in white inclusions, CAI-s and AOA-s in carbonaceous chondrites [7-12],
- 3. at discovery of the presence of aqueous alteration products in the carbonaceous chondrites, [13-15],
- Over these waves of interest the rather small number of carbonaceous chondrites and recognition of new grouplets and clans among them [5], [16-19], the great individuality of these chondrites were always attractive and emphasized.

We and other groups studied the new KABA material with various methods (Mössbauer-spectroscopy, chemical analyses for amino acids and other organic compounds). Our recent report gives an overview of the components and shows new data and results of the EPMA investigations.

**TEXTURE.** The overall view of the large KABA thin section surface shows an oriented texture: there are matrix-type inclusions which emphasize this. Such inclusions have longer di-

mensions more than 1 mm in the direction of the overall stratification, and smaller than 1 mm perpendicular to it.

**Chondrules:** Chondrule sizes vary between 0.2 and 3.5 mm in diameter. There are many types of chondrules: porphyritic olivine, granular, radial pyroxene and barred olivine (Fig.1.) types. The chondrules are frequently layered, mixed, where silicates and opaques form layers. Chondrule cores are frequently surrounded by a ring of opaque belt (a common characteristic in CR chondrite chondrules [18]). Large majority of opaques are contained by chondrules. Higher resolution BSE images reveal these opaque grains as different coexisting metal, magnetite and sulfide assemblages.

**Matrix:** The KABA matrix is composed mainly from olivine, it has variable fayalite content and contains olivine crystals (up to 100 micrometers) with considerable fayalite component [19]. Matrix also contains magnetite [1] and maghemite (Márton, [20], the Fa content data and maghemite indication by the inverse spinel structure are in accord with the new Mössbauer data, Vértes A., pers. comm. 1997). Matrix contains sulfides: pentlandite and traces of troilite.

**Rims:** About one third of the chondrules are surrounded by rims, (frequently by sulfide-magnetite assemblages, which are similar to those, which form inner rings), however, because of the layered nature of many chondrules, rim material and outer belt of the chondrule can not be easily distinguished [21]. There are three 3 mm diameter sized chondrules with both layered structure and rim.

**Inclusions:** There are different types of refractory inclusions in KABA, [24], [25], [26]. We have found one remarkable spinel-rich spherule with 150 mikrometers diameter. The BSE image shows (Fig. 2.) the core: inner lighter region spinel, which has considerable FeO content (in the pleonaste range), and an outer darker region: Mg-Al spinel. Pleonaste inner region contains small (ca. 5 mikrometers) perovskite grains almost uniformly scattered. This spinel-perovskite spherule is surrounded by a Wark-Lovering type rim, and strongly resembles to BB-1 from Murchison of [22] in size and character [24].

**SUMMARY.** Preliminary studies on the new large thin section showed that KABA exhibits

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traces of an overall oriented texture, which is a new result not mentioned in earlier KABA studies. Layered chondrules, spinel-rich inclusions, opaque assemblages are common characteristics with other CV3 chondrites (Allende, Mokoia, [23] [25] [26]).

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