

ISHEYEVO: A NEW CB CHONDRITE. M.A. Ivanova¹, M.A. Nazarov¹, N.N. Kononkova¹, and F. Brandstaetter². ¹Vernadsky Institute of Geochemistry and Analytical Chemistry, Kosygin St. 19, Moscow 119991, Russia (venus2@online.ru). ²Naturhistorisches Museum, A-1010, Vienna, Austria.

Introduction: CB chondrites are rare metal-rich carbonaceous chondrites and are divided into two subgroups [1]: the CB_a subgroup (Bencubbin, Weatherford and Gujba), and the CB_b subgroup (HH237 and QUE94411). CB_a chondrites are coarse-grained (up to 1cm) and contain 40-60 vol% of FeNi metal. CB_b chondrites are fine-grained and richer in FeNi metal (>70 vol%). CB_b's also have CAIs, zoned metal grains and matrix lumps. In comparison with CHs, all CB's lack POP chondrules. We report on petrography and mineral chemistry of Isheyev, a new metal-rich carbonaceous chondrite found in Bashkortostan, Russia in October, 2003. Isheyev is a CB chondrite with unusual features.

Results: The Isheyev meteorite has a well developed dark brown fusion crust and consists of FeNi metal grains, abundant CC, POP, PO, BO chondrules, rare zoned olivine-pyroxene chondrules, chondrule fragments, CAIs, and hydrated matrix lumps. Chondrules and metal grains are 0.02-1 mm in size. Isheyev has petrological type 3, shock stage S1 and weathering grade W1.

FeNi metal content varies from 30 to 70 vol% in different sections. The mean is 52 vol%. FeNi metal grains are mostly homogeneous but some are zoned. Typical metal grains contain 4.2-8.4 wt% Ni, 0.2-0.5 wt% Co, and 0.03-0.6 wt% Cr, but there are rare FeNi grains containing 26 wt% Ni and 0.6 wt% Co. Nickel and Co are positively correlated; Cr is negatively correlated. The Co/Ni ratio of the Isheyev metal is solar. In zoned metal grains, Ni content decreases and Cr increases smoothly towards the edges. Troilite blebs are enriched in Cr (2.5-13 wt%). Olivine and low Ca pyroxene are Mg-rich, Fa_{2.5} and Fs_{2.1}Wo_{1.7} respectively and occur in Mg-rich POP and PO chondrules of Type I. Fe-rich olivine (Fa₁₀₋₃₈) and pyroxene (Fs₈₋₁₂Wo_{0.8-1.8}) occur in Type II POP, PO, and BO chondrules containing a glassy mesostasis. Unusual zoned olivine-pyroxene chondrules are similar to those from the NWA 470 [2] and Acfer 182 [3] CH chondrites. Grossite-rich CAIs are abundant. INAA data for a 20 mg chip of Isheyev are: 2.74 wt.% Ni; 717 ppm Co; 2608 ppm Cr, 8.2 ppm Sc, and 1.59 ppm Ir.

Discussion: Based on the FeNi metal content (30-70 vol%), Isheyev definitely belongs to the CB chondrites. However, chondrule and metal grain sizes (0.02-1 mm) are similar to CH and CB_b chondrites. Unlike all CB chondrites, chemical compositions of Isheyev olivine and pyroxene are very variable. With both type I and II POP chondrules, Isheyev is similar to CH chondrites, but not to any CB chondrites. Unusual zoned olivine-pyroxene chondrules are also typical for CHs. Similar to CB_b's, Isheyev contains CAIs, but grossite-rich CAIs are more abundant in CHs. Like CB_b's and CH's, Isheyev has chemically zoned metal grains and heavily hydrated matrix lumps. CAIs, zoned FeNi metal grains, and Mg-rich chondrules have definite features of nebular condensation. In mineral chemistry, the presence of grossite-rich CAIs, POP and zoned chondrules, in chondrule and metal grain sizes, Isheyev is closer to CHs and supports the genetic unity of the CR-CH-CB clan.

References: [1] Krot et al., 2002. *Meteoritics & Planet. Sci.* 37, 1451-1491; [2] Ivanova M.A. et al. 2003. *Meteoritics & Planet. Sci.* 38:A28; [3] Hezel D.C. et al. 2003. *Meteoritics & Planet. Sci.* 38, 8, 1199-1215.