

Ferromanganese Crusts of the Mendeleev Ridge (Arctic Ocean)

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We present here the data of ferromanganese crusts from the Southern Mendeleev Ridge (Fig. 1). Dredging site was located on the southwestern slope of local depression up to 2770 m depth. The set of analyses included EM diffraction method to study a mineral composition (7 samples), ICP-AES, ICP-MS (27 samples) and AAS (35 samples) for chemical composition studies.

The comparison with crusts from the Magellan Seamounts in Pacific [1] reveals that in general ferromanganese crusts of the Mendeleev Ridge are depleted in Mn, Co, Ni. However, in the upper layer of samples Ni and Co reach 0,44% and 0,42% respectively and comparable to crusts from the Pacific, Atlantic and Indian Oceans. The crusts contain high concentrations of some rare elements, i.e. Li (up to 150 ppm), Th (up to 87 ppm) and Sc (up to 66 ppm). Crusts from the Chukchi Borderland, which were discovered by US scientists demonstrate high value of Sc, Th, and Li as well [2]. Observed similarities in chemical composition of crusts from the Mendeleev Ridge and Chukchi Borderland could indicate the regional enrichment of the rare elements in this area. The source of this enrichment hadn't been clearly determined.

[1] M. Mel'nikov Co-rich ferromanganese crust deposits// Gelendzhik: "Uzhmorgeologia", 2005. – 230p (in Russian). [2] J. R. Hein, J. Klofas, K. Mizell, T. Conrad. Rare-Metal-Rich Ferromanganese Mineral Deposits from the Western Arctic Ocean//UMI 2012