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EVOLUTION OF CHROMIUM-VANADIUM MINERALIZATION
IN MASSIVE SULFIDE ORES AT THE BRAGINO OCCURRENCE
OF SOUTH PECHENGA STRUCTURAL ZONE (KOLA REGION)
BY EXAMPLE OF SPINEL GROUP MINERALS

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An evolutionary series of spinel group minerals: chromite—coulsonite—magnetite, has been revealed by mineralogical studies in massive sulfide ores of Bragino occurrence (South Pechenga structural zone, the Kola region). Chromite is primary in this association, it occurs there both as individuals of its own and in form of relicts in central parts of coulsonite crystals. All chromites contain vanadium in different amounts. Coulsonite is the most abundant mineral, represented by individual octahedral crystals and their intergrowths. There is an isomorphic link between its main species-forming elements: V, Cr, and Fe^{3+} , in chemical composition of coulsonite. Magnetite, the latest mineral in the studied evolutionary series, has crystallized in form of octahedral and cub-octahedral individuals of its own, and, in addition, forms edge zone around coulsonite crystals, up to complete pseudomorphs after them. Investigations of optical properties and microhardness have been carried out with the purpose to reveal some new data for rare spinel group minerals. Results of these studies were used in comparative analysis of the dominant role of a species-forming element in the spinel group mineral individuals.

Key words: coulsonite, chromite, magnetite, vanadium, chromium, massive sulfide ores, Kola region.