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I. A. BLINOV.** THERMODYNAMICS OF ARSENATES, SELENITES
AND SULFATES IN THE OXIDATION ZONE OF SULFIDE ORES.
XIV. MINERALS OF SELENIUM IN THE OXIDATION ZONE OF THE
JUBILEYNOE MASSIVE SULFIDE DEPOSIT, THE SOUTH URALS

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Selenium is an essential trace element in sulfide ores. The selenium minerals (clausthalite, PbSe, tiemannite, HgSe, and naumannite, Ag₂Se) have been found with goethite and siderite as newly formed phases in the oxidation zone of the Jubileynoe copper-sulfide ore deposit at the Urals, in Russia. Thermodynamic modeling was used to assess physical-chemical parameters of selenide stability, and estimate the possibility of the Pb, Hg and Ag selenites formation while the oxidation of sulfide ores. Eh—pH diagrams of Fe—S—CO₂—H₂O, Fe—Se—CO₂—H₂O systems were calculated for physi-

cal-chemical formation conditions of the oxidation zone of the Jubileynoe deposit, as well as for systems M—Se—H₂O and M—S—H₂O (M = Hg, Pb, Ag). Exchange reactions between sulfides and selenides have allowed estimating the ratio of selenium and sulfur activities in the mineral-forming media. It is shown that among selenites of lead, silver and mercury only PbSeO₃ compound may be formed theoretically in the oxidation zone of the Jubileynoe deposit.

Key words: selenium, oxidation zone, massive sulfide ores, thermodynamics, modeling.