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Rare and Other Valuable Metals in Coal Deposits of the Far East of Russia

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In the Far East of Russia, there are a great number of brown coal deposits, which host industrial concentrations of Ge, Ga, Ve, Sc, W, Sb etc., with rare metal resources of many thousands of tonnes. The authors studied following coal deposits of the Far East of Russia: Khabarovsk Territory: Liansky, Hurmulinsky (Hurmulinisky Prospect), Khabarovskiy, Bazovskiy, deposits; Amur Region: Erkovetskiy (Zapadny Prospect) deposit; Sakhalin Region: Novikovskiy (Vostochny Prospect, reserve area of the Novikovskiy section) deposit; Magadan Region: Lankovskiy, Viliginitskiy (the Elikchan-Kupkinskiy area), Elgenskiy (non-licensed stock of prospects) deposits; Kamchatka Region: Korfskiy (non-licensed stock of prospects), Echvayamskiy (Losiny lot) deposits.

Rare metal resource potential of metal-bearing coals of the non-licensed stock of prospects in the Far East Federal District has been assessed according to categories of estimated resources («P₃» and «P₂» according to the Russian classification). In 12 studied coal deposits, the amount of rare metals estimated resources of category P₂ are as follows: Sc – 11.98 thousand tonnes, Ga – 10.94 thousand tonnes, Ge – 7.18 thousand tonnes, Rb₂O – 40 thousand tonnes, SrO – 137 thousand tonnes, Cs₂O – 3.6 thousand tonnes, ZrO₂ – 36.3 thousand tonnes, TR₂O₃ – 212.8 thousand tonnes. Category P₃: Sc – 14.4 thousand tonnes, Ga – 16.4 thousand tonnes, Ge – 9.8 thousand tonnes, Rb₂O – 46.3 thousand tonnes, SrO – 125.7 thousand tonnes, Cs₂O – 9.16 thousand tonnes, ZrO₂ – 135.6 thousand tonnes, TR₂O₃ – 266.18 thousand tonnes. PGM of category P₂ amount to 15.1 tonnes and those of category P₃, 24.4 tonnes.

Economic-geological evaluation based on consolidated indices of promising coal deposits of the non-licensed stock of prospects of the Far East was made taking into account their rare metal potential. The account of rare and other valuable metals in the coal allows a more complete estimation of real economic potential of the coal deposits and non-licensed stock of prospects, their profitability and investment appeal, promotes strengthening the mineral-raw base of metallurgical and other industries. Accounting and organization of accompanying mining of some rare and other valuable metals from metal-bearing coal deposits will allow essential increase in economic efficiency of the development of these deposits.

A GIS map with a database on metal contents in coals of the Far East accompanied by a set of graphics characterizing coal deposits of the Far East Federal Area has been compiled at a scale of 1:2,500,000.

As a result of the study, a conclusion was drawn that it would be expedient to treat some coal deposits of the non-licensed stock of prospects of the Far East as complex deposits of a new type: rare metal-coal

deposits and not only as raw sources of coal. The mentioned-above considerable estimated resources of REM, Sc, V, Ga, Rb, Cs, Sr, platinum group metals as well as other metals in the studied deposits testify to a new nonconventional considerable mineral-raw base of rare metals and other valuable metals in brown coal deposits.

