

## **HYDROTHERMAL REE MINERALIZATION ASSOCIATED WITH LATE CENOZOIC MAFIC VOLCANISM IN THE RUSSIAN FAR EAST**

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Unusual hydrothermal REE mineralization in a pipe-shaped structure filled by argillized mafic dikes (N-Q) and brecciated shists (PZ) were found in the Khanka Massif near a Late Cenozoic graben. The REE ores in the explosion structure are characterised by clear zonality and strong REE fractionation. Y-rich ores (REE+Y= 0.1-0.6%, Y=40-70% of total REE+Y) dominated by hydrous carbonates (kimuraite, lokkaite, Nd-lanthanite) are located in the argillized rocks at the central part of the structure. Ce-rich ores (REE+Y= 0.5%, Ce=90% of REE+Y) consisting of Fe-Mn oxyhydroxides (Al-lithioforite, criptomelane, hollandite goethite, ferryhydrite) with sorbed REE and tiny impregnation of fine-grained LREE-bearing minerals (LREE- and pure Ce-bearing oxides, silicates, phosphates and titanates) are situated at the peripheral parts of the structure and at fractures in overlaying rocks. Y-rich ores are enriched in Zn (up to 1%), Ni (up to 0.2%) and Ag (a few ppm), Ce-rich – Co (up to 2.65%), Ba (up to 1.4%), Ni, Cu, Pb, Zn, V (up to 0.2-0.6%), Mo, Tl, Ag, Bi (up to 0.01-0.02%). The genesis of the hydrothermal REE mineralization was related to the intrusion of mafic dikes and associated gas and hydrothermal activity. REE ores resulted from the mixing of juvenile fluids enriched in CO<sub>2</sub> and Cl and meteoric waters near the surface. The isotope composition of the Nd-lanthanite ( $Nd^{143}/Nd^{144}=0.512133\pm 6$ ,  $Sr^{87}/Sr^{86}=0.71361\pm 8$ ) shows crustal source of the REE. It is suggested that similar pipe-shaped structures could be the roots of stratabound REE mineralization, which was recently discovered in coal-bearing strata at the adjacent depression.