

Distribution coefficients of transition metal elements between lower mantle minerals and metallic liquid

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We made experiments on partitioning of transition metal elements V, Cr, Mn, Fe, Co, Ni between metallic liquid and silicate perovskite containing Al_2O_3 .

The high-pressure experiments were carried out under P-T condition of 24.3 GPa and 2473K. The recovered samples were analyzed by using EPMA.

The results of experiments indicate that distribution coefficients D for Cr, Mn, Fe, Co and Ni between metallic liquid and perovskite have no remarkable Al_2O_3 dependency and those of V have negative Al_2O_3 dependency. On the other hand, D for V, Cr and Mn have negative oxygen fugacity dependency, whereas those of Fe and Co have no oxygen fugacity dependency, and those of Ni has positive dependency. Some other mechanisms should be considered to account for the observed mantle abundances of these elements.