THE PECULIARITY OF THE METHOD OF METALLIC AND SILICATE MELTS SEPARATION: MODELLING WITH HIGH-TEMPERATURE CENTRIFUGE

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It has been proposed that core formation in a planetary body could be the results of the large scale differentiation of a planet during much of its accretion, probably during the deep magma ocean stage of early Earth and Moon differentiation when molten Fe-S-alloy and molten silicate underwent gravitational separation. Because of the poor knowledge of the physical phenomena connected with the multiphase system differentiation, many aspects of the evolution of partially molten zones remain disputable. In this study the simulation of liquid and crystal separation in a high-temperature centrifuge was carried out. Here we have examined peculiarities of the mechanism of segregation and accumulation of metallic and sulfide phases in the gravitational field at controlled oxygen fugacity. The construction of the reaction chamber allows for the reliable fixation of the preset partial oxygen and sulfur pressure during rotation. Phases equilibrium in the system Fe-S-C-O is not only of the temperature, pressure function, but is also function of the oxygen fugacity. Experiments were performed with a high-temperature centrifuge at temperature of 1200-1400^{o}C, atmospheric pressure and sulphur fugacity and acceleration of 3000-4000 g. The conditions of experiments were hydrostatic. The duration of centrifugation was 15 minutes.

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