

Density measurements of molten FeS at high pressure and high temperature

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Density of molten iron alloy is one of the key parameters to control core-mantle separation in the early Earth. Here we report the results of the sink/float experiments on the molten FeS at high-pressures. Experiments were conducted by using a KAWAI-type high pressure apparatus up to 5 GPa and 1900 K, in which rutile-type TiO_2 was used as density marker. Sinking and floating of density marker in the molten FeS was judged by observation of the quenched run products. Density range of molten FeS was confined at high pressures and temperatures. Combined with density of FeS melt at atmospheric pressure (Nagamori, 1969), the bulk modulus of FeS melt was calculated to be $K_T = 14.5$ GPa at 1900 K by Birch-Murnaghan EOS from present density data. Isothermal bulk modulus of molten FeS is consistent with that of Fe-FeS eutectic melt reported by Sanloup et al (2000).