

Structure and physical properties of molten iron-sulfur alloys at high pressures

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We have investigated the structure of molten Fe-FeS alloys at high-pressures by X-ray diffraction analysis using synchrotron radiation. Structure of Fe-S melts continuously changes with sulfur content between Fe end and Fe-FeS eutectic point, in which S atoms randomly distributed among closed pack Fe atoms. On the other hand, in FeS end member, nearest neighbor atomic pair is Fe and S. Fe-FeS eutectic melts are slightly compressed by pressure but does not change its structure. Structure of molten Fe-FeS alloys is consistent with its viscosity and diffusivity.