

Abstract Submitted
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Chemical Reactions Between Iron and $(\text{Mg}_{0.92}, \text{Fe}_{0.08})\text{SiO}_3$ Perovskite under Shock Compression¹ XIUFANG CHEN, ZIZHENG GONG, LI ZHANG², LIWEI DENG, Institute of Physics, Southwest Jiaotong University, Chengdu 610031, P.R. China, YINGWEI FEI, Geophysical Laboratory, Carnegie Institution of Washington, Washington DC 20015, USA, FUQIAN JING, Laboratory for Shock Wave and Detonation Physics Research, Institute of Fluid Physics, P.O.Box 919, Mianyang, Sichuan 621900, China — The possible chemical reactions between liquid iron and $(\text{Mg}_{0.92}, \text{Fe}_{0.08})\text{SiO}_3$ perovskite was checked up to 115GPa shock pressure (the corresponding temperature is estimated about 4950K). The XRD observations showed the main composition of the recovered samples is Fe and $(\text{Mg}, \text{Fe})_2\text{SiO}_4$, and no evidence for the existence of $(\text{Mg}_{0.92}, \text{Fe}_{0.08})\text{SiO}_3$ perovskite. We inferred that the chemical reactions between iron and perovskite happened during shock compression. It suggest that reactions between liquid iron and $(\text{Mg}_{0.92}, \text{Fe}_{0.08})\text{SiO}_3$ perovskite should occur at the core-mantle boundary conditions, creating a very heterogeneous zone at the base of the mantle.

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