

High temperature generation using semiconductor diamond heater at high pressure

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Melting relations of the Earth materials are information essentially important to clarify the early differentiation and evolution of the Earth. Nevertheless melting experiments using the Kawai-type apparatus under mid mantle conditions are impossible because of limited temperature generation. Following Shatsky et al. (2009), we have tried to generate temperatures higher than 3500 K adopting B-doped semiconductor diamond heater. In order to carry out melting experiments at higher than 50 GPa, we adopt sintered diamond anvils. Temperature (T) is estimated by extrapolating a T-W (power) curve constructed up to 2600 C based on the W/re thermocouple measurement. Our T-generation reached ca. 4700 C at 55GPa.

Keywords: High temperature generation, Semiconductor diamond heater, Kawai-type apparatus, sintered diamond