

The 478th Geodynamics Seminar

Melting experiments of Earth's lower mantle minerals in binary systems

Youmo Zhou (Postdoctoral Researcher, GRC)

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Research Bldg. 1, Ehime Univ.**



Abstract

Determining the melting phase relations in natural rock-forming multi-component systems at high pressures is essential for understanding the crystallization of the deep magma ocean of the early Earth and the origins and consequences of the deep mantle melting. Although numerous melting experiments have been performed for these purposes, the range of parameter space (typically, pressure, temperature, and composition) studied is still limited for comprehension.

To understand the above-mentioned deep Earth issues, we are doing high-pressure melting experiments on the binary systems that are included in the SiO_2 - MgO - CaO ternary system. The experiments give the component solubility in each end-member, the solidus temperature, and the eutectic composition, which can be used in thermodynamics to calculate the phase equilibrium. In this presentation, I will talk about the experiments on the MgSiO_3 - CaSiO_3 and CaSiO_3 - SiO_2 systems at 24 GPa.

Contact : Dr. Nishi (e-mail: nishi@sci.ehime-u.ac.jp)