Geodynamics Seminar

第312回ジオダイナミクスセミナー

Pressure, Temperature and Al-content dependences of P- and S-wave velocities in Al-bearing Stishovite

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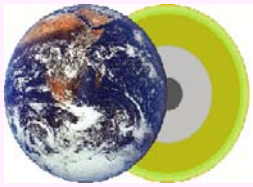
主催：愛媛大学地球深部ダイナミクス研究センター
日時：12/16（金）午後 4時30分～
場所：総合研究棟 4F 会議室



EHIME UNIVERSITY GRC GEODYNAMICS RESEARCH CENTER

Abstract

Like continental crust, mid-oceanic ridge basalts and sediments are enriched in Silicon. It has been suggested that subduction processes provide a way of enriching the mantle with silica. Above 10 GPa, SiO_2 transforms to stishovite with a tetragonal rutile structure (space group $P4_2/mnm$), which is believed to be an abundant mineral of mid-oceanic ridge basalts subducted to the mantle transition zone (MTZ; Irifune et al., 1994). Stishovite has a relatively high-density compared to other constituent minerals of subducted slabs, and could generate chemical and density heterogeneities in the deep mantle. Therefore numerous studies reported the physical properties of pure stishovite (see Andrault et al., 1998, and references therein). However, in the subduction context, stishovite can contain up to 2.5 wt% Al_2O_3 in dry systems (Liu et al., 2006) and up 9 wt% Al_2O_3 in hydrous systems (Ono et al., 1998). The incorporation of even small amounts of Al and its possible coupling with oxygen vacancies can influence the stability, density and compressibility of SiO_2.

Here, we report new ultrasonic interferometry data on Al-bearing stishovite (+1 and 9wt% Al_2O_3) measured *in situ* at high-pressure and high-temperature using a Kawai-type multi-anvil press apparatus coupled with synchrotron radiation. The thermoelastic properties of Al-stishovite are discussed in subducted slab context, in order to infer appropriate mineralogical model in subduction zones.

詳細は当センターホームページ: http://www.ehime-u.ac.jp/~grc/をご覧ください
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