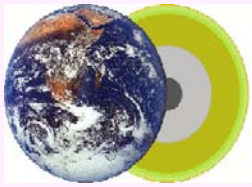
Geodynamics Seminar

第323回ジオダイナミクスセミナー

Element strategy, nano-polycrystalline stishovite, and DESY

Dr. Norimasa Nishiyama (Associate Professor, GRC)

主催：愛媛大学地球深部ダイナミクス研究センター
日時：3/16（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

Element strategy is a concept to accomplish technology based on elements that are easily obtained on the Earth's surface. Modern technology depends strongly on heavy metals such as platinum and tungsten and it is believed that these precious metals can be used up by 2050. I believe that we, Earth scientists, can play an important role in research projects of Element strategy, because industrial use of silicon, magnesium, iron, and aluminum is the main target.

Nano-polycrystalline stishovite (NPS) is a very hard (Hv = 28 GPa) and super tough (K_{1C} = 13 MPa $m^{1/2}$) ceramics material and a candidate material replacing tungsten carbide (WC). Industrial use of NPS can therefore make contribution for preservation of tungsten resources. It has been well known that stishovite is one of the hardest oxides but super tough nature of NPS was unexpected. It is still difficult to elucidate mechanism of toughening of NPS. I would like to show you difference between NPS and some typical tough ceramics, silicon nitride and zirconium oxide, and try to make discussion on toughening mechanism of NPS.

In the end of this presentation, I would like to talk about a new synchrotron facility in Germany, DESY – PETRA III. I will be in charge of construction of a large volume press beamline with brilliant light source. I would like to introduce our future project in DESY – PETRA III.

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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