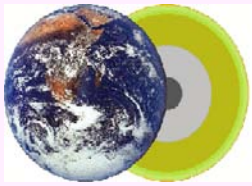
Geodynamics Seminar

第374回ジオダイナミクスセミナー

High pressure synthesis of Nano-layered diamond sintered compact and its characterization

Dr. Futoshi Isobe (Postdoctoral Fellow, 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：1/24（金）午後 4時30分～
場所：総合研究棟Ⅰ 4F 共通会議室



EHIME UNIVERSITY GRC GEODYNAMICS RESEARCH CENTER

Abstract

Since a major breakthrough was made in the synthesis of binder-less nano-polycrystalline diamond (NPD) from graphite, an extensive series of studies have been conducted on its conversion mechanism, microtextures and physical properties. The optical transparency and ultra-high hardness of NPD have drawn considerable attention for various industrial and scientific applications.

NPD is characterized by its unique microtexture usually composed of a mixture of randomly oriented equigranular crystals of tens of nanometers and lamellar crystals staking along [111] direction of diamond. The former is formed by the diffusion process from nano-crystalline graphite particles which mainly accounts for the starting graphite source (consolidated polycrystalline graphite), while the latter is formed by diffusion-less (martensitic) process from relatively large well crystallized graphite mixed in the nano-crystalline graphite matrix (Ohfuji et al., 2012). Therefore, the transformation pathway and resulting microtexture of NPD produced through direct conversion method is most likely determined by the crystallinity (grain size) of the initial graphite sources.

Based on this aspect, we have recently synthesized a new type of NPD which consists entirely of layered (highly oriented) nanocrystals by direct conversion from highly crystallized graphite. In the seminar, I will describe the properties and potential application of such a new NPD.

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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