Geodynamics Seminar

第351回ジオダイナミクスセミナー

Crystallization and microtexture development of diamonds through the phase transition from graphite and related carbons

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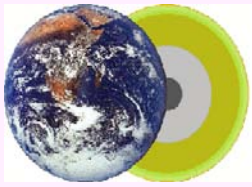
主催：愛媛大学地球深部ダイナミクス研究センター
日時：3/1（金）午後 4時30分～
場所：総合研究棟 4F 会議室



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Abstract

Physical property of polycrystalline materials is related closely to their microtexture and grain boundary structure. Polycrystallite composed of submicron crystals sometimes exhibits unique and distinguishing characteristics due to significant amounts of structural defects and dangling bonds involved in those nanocrystals. Nano-polycrystalline diamond (NPD) and nano-polycrystalline stishovite (NPS), both characterized by extremely high hardness and fracture toughness, are typical examples of such advanced outcomes. In recent years our research group has been investigating the crystallization mechanism and microtexture development of diamonds (hexagonal and cubic) produced by the phase transition from graphite and related carbon species under high pressure and high temperature. The present talk will be a summary of our experimental studies clearly demonstrating that the microtexture of diamond(s) is largely dependent on the crystallinity of the graphite starting sources. For example, when using low crystalline carbon sources such as finely-milled graphite, the products consist exclusively of very fine particles of 1-2 nm (amorphous-like) to a few tens of nanometer, which can be controlled simply by adjusting heating temperature (diffusion-limited growth). On the other hand, when using highly crystalline graphite the products obtained are composed purely of layered crystals of hexagonal and/or cubic diamond(s) formed by the martensitic transformation from graphite.

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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