Geodynamics Seminar

第302回ジオダイナミクスセミナー

Low temperature and high pressure properties of methane hydrate

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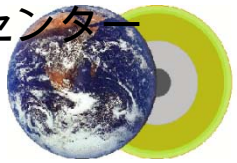
主催：愛媛大学地球深部ダイナミクス研究センター
日時：7/22（金）午後 4時30分～
場所：総合研究棟4F　共通会議室



EHIME UNIVERSITY GRC GEODYNAMICS RESEARCH CENTER

Abstract

Ices and gases are the most major components in the universe. The inner planets including our planet, the Earth, are composed mainly of rocks and metals. While, the planets and their satellites far from Jupiter are thought to consist mainly of ices and gases. In addition, recently exoplanets have been found one after the other, which are also inferred to be icy bodies. Methane hydrate is a clathrate compound consisting of cages formed by hydrogen-bonded host water molecules, with guest methane molecules in the cages. The hydrate is called burning ice, and is expected as a fruitful energy resource, while methane is a greenhouse gas even more effective than carbon dioxide on global warming. Looking towards universe, ubiquitous presence of methane hydrate has been reported in and outside the solar system.

For pure water ice, physical properties in a wide range of conditions have long been studies from the importance of material and planetary sciences. While, for gas hydrates, high-pressure properties at room temperature have been comprehensively studied over the past decade, however, the investigation at low temperatures and high pressures has been quite limited. In our recent study, low temperature and high pressure experiments of methane hydrate were performed in the temperature and pressure ranges of 300 to 30 K and 3.0 to 77.0 GPa, respectively. The results suggested that negative thermal expansion occurred below approximately 150 K in all pressure range examined. Possible mechanisms of the negative thermal expansion were discussed in relation to behaviors of pure ices. In this seminar, a wide variety of states of pure water ice in universe and the low temperature behavior of methane hydrates are introduced.

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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