

## Polymerization of coronene at high pressure and high temperature

# Rie Shirase[1], Eiji Ohtani[2], Tadashi Kondo[3], Tomoaki Kubo[4]

[1] Tohoku Univ., [2] Institute of Mineralogy, Petrology, and Economic Geology, Tohoku University, [3] Sci., Tohoku Univ., [4] Tohoku Univ

Coronene (C<sub>24</sub>H<sub>12</sub>) is one of PAHs (polycyclic aromatic hydrocarbon), and is one of the important candidates for organic compounds in space. It is very stable material and seldom dissolves in water. Actually, coronene is an important organic matter in the primitive materials such as carbonaceous chondrites, and its IR spectrum is like that of nebra.

In this study experiments were carried out at high pressure and high temperature in order to investigate the stability of coronene. MA-8 type multi-anvil apparatus were used for the high-pressure experiments. Samples of coronene were compressed in these instruments, and the recovered samples were analyzed by FTIR spectrometer, Raman spectrometer, powder X rays diffraction, MALDI.

The present result implies that coronene decomposes at 3.7GPa and 1073K, and the recovered sample consists of graphite etc. The other experiment conducted at 6GPa and 1073K shows, coronene is polymerized into dicoronylene (dimer), and trimer and tetramer compounds in this condition. This is the first report for synthesis of trimer and tetramer of coronene. We will discuss a possible stability of coronene in the icy

bodies based on the present experiments.