

The biomarker composition of petroleum-like substance isolated from methane hydrate in RC 1403 core

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A substance like petroleum was isolated from the thick methane hydrate layer located at the RC 1403 core depth of 27m. Similar petroleum-like substance was included in the rounded gravel bed above the methane hydrate layer.

After the isolation and separation of a biomarker, GC/MS analysis was performed. The nature of the substance like petroleum, origin, history of the heat and microorganism decomposition was argued. The hydrocarbon fraction and ketone/ester fraction were used for this study.

A hydrocarbon fraction is characterized by the existence of hump in the low carbon number area, and two kinds of bicyclic sesquiterpanes and small amount of C₂₅ tetracyclic terpane. On the other hand, n-alkane nor acyclic isoprenoids such as pristane and phytane were not detected in the chromatogram of hydrocarbon fraction. The feature of hydrocarbon fraction resembled to the very heavy biodegraded oil.

Ketone/ester fraction was characterized by hopanic and hopenic ketone.

In a particular, the angiosperm marker such as upanoid ketone, ursanoid ketone was detected. The existence of angiosperm marker indicates that the source of substance like petroleum was affected by terrestrial higher plant.

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