

## **lipid biomarkers and their stable carbon isotope investigation of Ancient seep carbonates from SW Taiwan**

HONGXIANG GUAN<sup>1</sup>, DUOFU CHEN<sup>2</sup>, QINXIAN  
WANG<sup>2</sup>, NENGYOU WU<sup>1</sup>, SHENGYI MAO<sup>1</sup>

<sup>1</sup> CAS Key Lab of Renewable Energy and Gas  
Hydrate, Guangzhou Institute of Energy  
Conversion, Chinese Academy of Sciences,  
Guangzhou 510640, China

<sup>2</sup> Key Laboratory of Marginal Sea Geology,  
Guangzhou Institute of Geochemistry, Chinese  
Academy of Sciences, Guangzhou 510640, China

Limestones JA-4, JA-5, JX-8 and BG-12 were collected from Southwestern Taiwan. Those limestones were supposed to form in anaerobic oxidization of methane (AOM), but the biogeochemical processes that occurred during the limestone precipitations are need to be confirmed, the sources of carbon and organic matter are still unclear. Here, a molecular and isotopic investigation of limestones was conducted to determine the biogeochemical processes, the sources of carbon and the organic matter. Lipid biomarkers diagnostic for AOM with <sup>13</sup>C-depletion (as low as -109.8) were found in samples JA-4, JA-5 and JX-8, suggesting that those limestones were resulted from AOM and a significant input of biogenic methane. There are no characteristic lipid biomarkers for methanotrophic archaea in limestone BG-12, the short-chain and long-chain *n*-alkanes account for 30% and 45% of all hydrocarbons, respectively with CPI of 1.2 and Pr/Ph index of 2.5, which suggested that the *n*-alkanes mainly derived from leaf waxes of higher plants, and the limestone BG-12 formed at a suboxic condition.