

Abstract

Recently, Methane Hydrate (MH) in the sea area of Japan has been attracting attention as a future energy resource. In order to promote the development of MH in the future, impact assessment of methane on marine species is necessary to grasp its influence, where methane is one of the decomposition products of MH. This study conducted the ecological effects test to evaluate the acute toxicity of methane on marine organisms, which were 2 species of phytoplankton (Prasinophyte; 1 species, Diatom; 1 species), 5 species of zooplankton (Copepod; 4 species, Decapod; 1 species), and nematode in the eastern Nankai Trough or their allied species. The test conditions were 1 atmospheric pressure, seawater temperature of 20°C, salinity of 35.0, dissolved oxygen of ≥ 6.0 mg/L, and within seawater of these conditions, the methane concentration of 17.3 mg/L was set, which is the possible maximum dissolved concentration. Five test concentrations of methane were prepared below 17.3 mg/L at a geometric ratio of 2.1 maximum. For the each test endpoints of phytoplankton, zooplankton, and nematode, inhibition of growth at 72 h, immobility at 48 h, and mortality at 72 h, were set respectively. The result of the tests suggested the acute toxicity of methane on these organisms were not observed. This is because the values of test endpoints remained low level as the methane concentration increased, even at the maximum methane concentration of 17.3 mg/L.