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Abstract

It is necessary to develop technologies to reduce anthropogenic CO₂ emission into the atmosphere to control global warming. The ocean sequestration technology is one of the promising measures, considering a large potential capacity of CO₂ sequestration of the ocean. The RITE has advanced the project of "Study of Environmental Assessment for CO₂ Ocean Sequestration for Mitigation of Climate Change" for the ocean sequestration technology using the Moving Ship method by the subsidy of the Ministry of Economy, Trade and Industry.

In the ocean sequestration project, the technology assessment of the CO₂ ocean sequestration ability, the development of the environmental assessment technology, and the development of the CO₂ dilution technology have been conducted as an individual element technology. As a result, a lot of outcomes have been steadily accumulated, such as the CO₂ sequestration capacity of the ocean and economical benefit and risk by the ocean sequestration, development of a CO₂ acute influence model for marine organisms, development of a basic model for deep sea ecosystem, and development of CO₂ dilution and diffusion models, and grasp of design condition of CO₂ discharge nozzle. In this report, the results of the first half of the project's Phase 2 were chiefly explained. First, the concept of "CO₂ sequestration technology by the Moving Ship method" was described. Next, the some results of element technologies were explained, such as dissolution process of liquid CO₂, diffusion of dissolved CO₂ in ocean, and influence on marine organisms by dissolved CO₂. Finally, the result of "Case study of 50 million-ton/year ocean sequestration in a selected site" was introduced based on the knowledge and findings obtained in this research project continuing for more than ten years.