

Evaluation of CO₂ fixation using artificial upwelling system and issue of the practical use

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The development of the reduction technology of the greenhouse effect gas is sped up for the Global warming prevention. To search for the possibility in the ocean as the CO₂ absorption source expansion strategy, we examined the reduction method of combining the artificial upwelling system and Phytoplankton's CO₂ fixation ability.

The amount of the CO₂ absorption was calculated from the field observation data and the experimental data in the artificial upwelling area near Ikitsuki Island, Nagasaki Prefecture. The amount of the CO₂ absorption in this area was about 90,000-500,000tonCO₂/yr. The amount of CO₂ fixation becomes about 900-5,000tonCO₂/yr when assuming that 1% of absorption CO₂ is fixed to the ocean. On the other hand, the amount of the CO₂ emission according to the manufacturing installation of the marine structure was about 4,000ton-CO₂. It was shown that the CO₂ balance changed to absorption (fixation) within several years at least.

The problem of practical use as the CO₂ fixation technology has 1) Verification of effect CO₂ reduction of artificial upwelling system in the ocean carbon cycle, and 2) development of highly effective, low-cost artificial structure, etc. On the other hand, the influence of global warming and the oceanic acidification has the possibility of counterbalancing the effect of the technological development. The overall verification that considers these is also necessary.