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Development of a small temperature difference generator by the dissociation and expansion characteristics of CO₂ gas-hydrate

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An actuator system (gas-hydrate engine) using the dissociation and recombined continuous cycle of CO₂ gas hydrate was developed. The heat source temperatures required for the operation of the proposed system are in the temperature range of green energy and low-quality exhaust heat. The pressure of dissociation and expansion of a gas hydrate can fully power a compression gas engine with a temperature change from 268 K to 288 K. The use of green energy (high temperature) and night time cold air (low temperature) can easily provide this temperature difference in cold region areas. The dissociation characteristics of a hydrate can be used to develop a clean and efficient hydrate actuator. In this paper, the trial production electric power generator assuming above proposal mechanism is developed, the performance of the actuator system obtained from experiments is reported. Although the technology for changing the pressure difference of CO₂ gas into electric power influences power generation efficiency greatly, about 10% is obtained.

Biography

Masamitsu Takabatake is currently a Master's course student at the Kitami Institute of Technology, Japan.

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