

Modeling of swapping phenomenon for the gas hydrate production in 1-dimensional tube type reactor

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To explore fundamental information of replacement (also called as ‘swapping’) reaction, small-scale experiments were performed. In previous small-scale experiments, artificially synthesized methane hydrate particles were used in small size reactor (SUS reactor with 20~200ml internal volume). In this study, we extended our experimental scheme into 8m long 1-dimensional tube-type reactor. To simulate the gas hydrate reservoir under deep-sea sediments, glass beads were applied to produce porous environment. The replacement reaction in tube-type reactor was monitored during continuous injection of CO<sub>2</sub>+N<sub>2</sub> gas mixture (flue gas). Pressure and temperature was recorded and effluent gas composition was analyzed by gas chromatography.