INVESTIGATION OF GAS HYDRATES DISSOCIATION AND THE ROLE OF SURFACTANTS ON CARBON DIOXIDE HYDRATE FORMATION

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In this paper first, the thermodynamics and the kinetics of gas hydrate decomposition via Kim model in the seafloors was reviewed; then, by a stainless-steel test cell reactor and Omega data acquisition software, it's correlation to sandy environments was formulated via numerical fitting obtained from data acquisitions. In the first stage of dissociation, when the rate controlling factor is dissociation heat, the formulation of correlated dissociation rate was expressed and in the second stage of dissociation, when the rate controlling factor was mass transfer, the modified rate constant factor instead of Kim constant factor was determined. This research also investigated the effect of synthetic biosurfactants on carbon dioxide hydrate formation and consequently, methane production from hydrate permafrosts. It investigated the sequestration potential of carbon dioxide hydrates in ocean sediments. Also, the catalytic effect of biosurfactants in these processes was investigated. Furthermore, as a hydrate former, carbon dioxide forms hydrates at moderate temperatures and pressures. This phenomenon could be utilized to capture and separate carbon dioxide from flue gases, and also has the potential to sequester carbon dioxide in the deep seabeds. We studied the effect of synthetic surfactants on carbon dioxide hydrate formation, catalysis and consequently, methane production from hydrate permafrosts in sediments. It investigated the sequestration potential of carbon dioxide hydrates in ocean sediments.