

Experimental Study of CO₂ Hydrate Formation in Presence of Different Promotors

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Abstract : One of the new technologies for CO₂ capture, storage, and utilization (CCSU) is forming clathrate hydrate. This technology has some unknowns and challenges that make it difficult to apply in the real world. The low formation rate is one of the main difficulties of CO₂ hydrate. In this work, the effect of different promotors on the hydrate formation rate has been studied. Two surfactants, sodium dodecyl sulfate (SDS), tetra-n-butylammonium bromide (TBAB), and cyclopentane (CP) as a thermodynamic promotor and their combination have been used for the experiments. The results showed that the SDS is a powerful kinetic promotor and its combination with CP helps to convert more CO₂ to hydrate in a short time.

Keywords : carbon capture, carbon dioxide, hydrate, promotor

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