

Chemical promotion of methane gas hydrates formation for energy storage applications

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Abstract

© SGEM2018. Gas hydrates have been represented as a promise technology for many of applications, as gas mixtures separation, CO₂ capture, transportation, and sequestration, transport and storage of methane, and seawater desalination. Reduction of onset temperature/time for hydrate formation and increasing the hydrate growth rate are very critical for these applications. In this study for the first time we want to introduce the application of gelatin as a cheap, biodegradable, sustainable and effective promoter for methane hydrate formation. Differential scanning calorimetry (DSC) measurements were used to determine the onset temperature of hydrate formation by temperature ramping method with different cooling rates. The results explained that gelatin increased the onset temperature of hydrate formation compared with pure water. In addition, the quantity of heat transferred with gelatin was enhanced in comparison with pure water. These results demonstrate that amount of hydrates formed in the presence of gelatin is much more than in pure water. Gelatin obtained as a new cheap and safe promoter for energy storage. We expect that this study will open up a new phase in research on bio hydrate promoter.

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Keywords

Biodegradability, Gelatin, Methane hydrate, Methane storage, Promoter

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