The Effective Parameters of Hydrate Formation in the Presence of Porous Media

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Abstract

Generally, the interest on the utilization of porous media in hydrate formation is mainly due to its natural occurrence in the ocean depths. The hydrate formation is potentially influenced by temperature, pressure, salinity, gas composition and interfacial surface area which can be affected by the presence of porous media. The effects of different types of porous media such as silica, activated carbon, carbon nanotube and silica gel on hydrate formation are considerable depending on the specific area, pore volume and pore size distribution. The presence of porous media in methane hydrate formation could affect the rate of hydrate formation and the amount of gas encaged in the hydrate phase. The mentioned parameters are important in selective gas separation utilizing hydrate technology.

In this study, the effect of the presence of porous media on hydrate formation technology was investigated. The aim was to provide a guide to future development in selecting suitable porous media in hydrate formation for gas purification and gas storage as an energy saving method.

Keywords: Separation, Storage, Gas hydrate, Nano-material.

Research Highlights:

- **The effect of the presence of porous media in hydrate formation was investigated.**
- **The type of porous media, its surface properties and specially the amount of water were reviewed as important parameters during hydrate formation.**
- **The hydrate formation was investigated as a replacing current commercial separation technoloy.**