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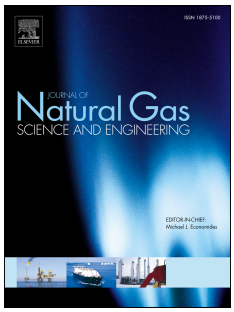

Variations in permeability along with interfacial tension in hydrate-bearing porous media

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Variations in permeability along with interfacial tension in hydrate-bearing porous media

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Highlights

Relative permeability of gas and water decreases along with IFT increases.

Effects of IFT on relative permeability rises as porous media size rises increases.

Porosity is a measure to volume rather than size or distribution of pore.

Abstract

This study extends our previous studies on the effects of the IFT on the seepage characteristics in hydrate-bearing porous media using pore network model with X-ray computed tomography. The results indicate that the relative permeability to both methane gas and water decreases as IFT increases. And the influence of the IFT on the two-phase relative permeability increases along with the particle size of the porous media. Moreover, the variation in absolute permeability is always positively related to average pore/throat radii in all type of hydrate-bearing porous media. In addition, the capillary pressure decreases along with IFT.

Keywords: *natural gas hydrate, interfacial tension, permeability, pore network model, X-ray computed tomography*

1. Introduction

Natural gas hydrates is proposed as a potential replacement for conventional energy sources because of their clean combustion and widespread global distribution (Chong et al., 2016 and Yang et al., 2014). The economical and safe commercial production of natural gas from hydrate

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