

Accepted Manuscript

Selective adsorption of supercritical carbon dioxide and methane binary mixture in shale kerogen nanopores

Tianyu Wang, Shouceng Tian, Gensheng Li, Mao Sheng



PII: S1875-5100(17)30472-9

DOI: [10.1016/j.jngse.2017.12.002](https://doi.org/10.1016/j.jngse.2017.12.002)

Reference: JNGSE 2377

To appear in: *Journal of Natural Gas Science and Engineering*

Received Date: 22 September 2017

Revised Date: 7 December 2017

Accepted Date: 10 December 2017

Please cite this article as: Wang, T., Tian, S., Li, G., Sheng, M., Selective adsorption of supercritical carbon dioxide and methane binary mixture in shale kerogen nanopores, *Journal of Natural Gas Science & Engineering* (2018), doi: 10.1016/j.jngse.2017.12.002.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 **Selective Adsorption of Supercritical Carbon Dioxide and** 2 **Methane Binary Mixture in Shale Kerogen Nanopores**

3

4 Tianyu Wang, Shouceng Tian, Gensheng Li, Mao Sheng

5 (State Key Laboratory of Petroleum Resources and Prospecting, China University of
6 Petroleum, Beijing 102249, China)

7

8 **ABSTRACT**

9 The adsorption of carbon dioxide and methane binary mixture in shale kerogen
10 nanopores and the underlying mechanism significantly affect the supercritical carbon
11 dioxide enhanced shale gas development project. In this study, we investigated the
12 adsorption properties of carbon dioxide and methane in shale kerogen using grand
13 canonical Monte Carlo (GCMC) method. Shale kerogen was fabricated based on
14 Ungerer molecular model and its parameters were validated. The effects of
15 temperature, pressure, mole fraction on the adsorption isotherms, average isosteric
16 heat, potential energy distribution, and adsorption selectivity of binary mixture were
17 discussed. The results show that the absolute adsorption capacity of methane in binary
18 mixture decreases as temperature increases, but increases as mole fraction increases.
19 Compared with methane, carbon dioxide is in lower energy absorption sites, which
20 indicates the adsorption capacity of carbon dioxide in shale kerogen is stronger than
21 that of methane. The adsorption selectivity of carbon dioxide over methane first
22 decreases as pressure increases until pressure reaches critical pressure (7.38 MPa for

Download English Version:

<https://daneshyari.com/en/article/8128407>

Download Persian Version:

<https://daneshyari.com/article/8128407>

[Daneshyari.com](https://daneshyari.com)