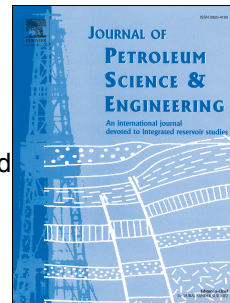


Accepted Manuscript

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Zhengshuai Liu, Dameng Liu, Yidong Cai, Zhejun Pan



PII: S0920-4105(18)30703-4

DOI: [10.1016/j.petrol.2018.08.037](https://doi.org/10.1016/j.petrol.2018.08.037)

Reference: PETROL 5217

To appear in: *Journal of Petroleum Science and Engineering*

Received Date: 11 April 2018

Revised Date: 30 July 2018

Accepted Date: 13 August 2018

Please cite this article as: Liu, Z., Liu, D., Cai, Y., Pan, Z., The impacts of flow velocity on permeability and porosity of coals by core flooding and nuclear magnetic resonance: Implications for coalbed methane production, *Journal of Petroleum Science and Engineering* (2018), doi: 10.1016/j.petrol.2018.08.037.

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1 **The impacts of flow velocity on permeability and porosity of coals by**
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4 Zhengshuai Liu^{a, b}, Dameng Liu^{a, b}, Yidong Cai^{a, b, *}, Zhejun Pan^c

5 ^a*School of Energy Resources, China University of Geosciences, Beijing 100083, China*

6 ^b*Coal Reservoir Laboratory of National Engineering Research Center of CBM Development & Utilization, China*
7 *University of Geosciences, Beijing 100083, China*

8 ^c*CSIRO Earth Science and Resource Engineering, Private Bag 10, Clayton South, Victoria 3169, Australia*

9
10 **Abstract**

11 The fluid flow velocity has a significant effect on the coalbed methane (CBM)
12 production by influencing the porosity and permeability of coals during the drainage
13 process. In this work, the fluid velocity sensitivity experiments combined with the
14 nuclear magnetic resonance (NMR) technology were performed to investigate the
15 impacts of various flow velocities on permeability and porosity. The results show that
16 the permeability of different rank coals has various characteristics with the increase of
17 flow velocity. For low rank coals, the permeability always increases first then
18 decreases with the increase of flow velocity. However, the permeability gradually
19 decreases with the increase of flow velocity for medium and high rank coals. For the
20 same rank coals, the higher initial permeability is, the more severe permeability
21 damage is. Additionally, the porosity variation reflected by NMR T_2 spectrum
22 indicates that T_2 between 10 ms and 200 ms is the main reduction space of seepage
23 paths. The influence of flow velocity on permeability is mainly due to the blockage of
24 fluid seepage space by coal fines. Moreover, the effects of dewatering rate on CBM

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