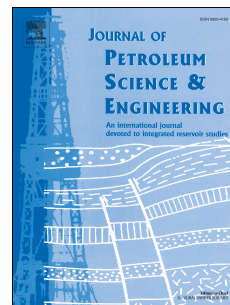


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Experimental study on sorption induced strain and permeability evolutions and their implications in the anthracite coalbed methane production

Ya Meng, Shimin Liu, Zhiping Li



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1 **Experimental study on sorption induced strain and permeability evolutions and**
2 **their implications in the anthracite coalbed methane production**

3 Ya Meng^{a,b,c,*}, Shimin Liu^c, Zhiping Li^{a,b}

4 ^a School of Energy Resources, China University of Geosciences (Beijing), Beijing 100083, PR
5 China.

6 ^b Beijing key laboratory of unconventional natural gas geological evaluation and development
7 engineering, Beijing 100083, PR China

8 ^c Department of Energy and Mineral Engineering, G³ Center and Energy Institute, The
9 Pennsylvania State University, University Park, PA 16802, USA

10 **Abstract:** The dynamic changes of strain-induced strains and permeability are two key parameters
11 to determine the production profile of coalbed methane (CBM) wells. Recent field observations
12 from a group of anthracite CBM wells demonstrate that the permeability dramatically changed
13 with depletion. In addition, different drainage strategies will induce different permeability
14 evolution due to different matrix shrinkage behaviors. We carried out a series of experimental
15 measurements on sorption induced strain evolution and its influence on permeability evolution for
16 anthracites using a desorption-seepage testing system. The relationship between sorption pressure
17 and its induced strains was studied. The results show that both axial and radial strains of a coal
18 specimen increase with continuous methane injection pressure. It was found that the strain
19 perpendicular to the bedding plane is higher than that parallel to the bedding plane. Under constant
20 confining and axial stresses, the effective stress decreases with the increase of methane pressure,

* Corresponding author. Corresponding author at: School of Energy Resources, China University of Geosciences (Beijing), No. 29 Xueyuan Road, Haidian District, Beijing 100083, PR China. Tel.: +86 10 13521520515

E-mail addresses: mengya629@163.com (Y. Meng).

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