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METHANOGEN MIGRATION AND ITS EFFECT ON PORE STRUCTURE OF COALS

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Abstract

The migration of methanogens in coal seams have great significance to study the improvement of coal bed gas (CBM) production by injecting microorganisms.This study aims to identify the migration characteristics of methanogens in different rank coals. Methanobacteria migration test was carried out by using coal samples of different particle sizes in the different rank coals. The results show that the maximum relative bacterial absorbance of a Qianqiu mine 18-35 mesh sample was 0.68, higher than that of the corresponding 60-80 mesh sample (0.46), while the corresponding absorbance for the 18-35 mesh and 60-80 mesh samples from Shaqu mine was 0.31 and 0.20, respectively. This suggests that methanogen migration is enhanced by the coals with both larger particle size and lower rank. In order to further study its effect on pore structure, the micron X-CT method was used to analyze the microscopic pore structure. The results show that the methanogen migration improved the coal porosity significantly, with a maximum increase of 8.46% in total porosity and of 10.97% in open pore porosity. This research demonstrates that, given the appropriate environmental conditions, the methanogens can actively migrate in coals and thereby improve coal porosity, which is beneficial to increase CBM production by injecting microorganisms.

Keywords: coal, coalbed methane, methanogens, migration, pore structure

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