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INFLUENCE OF COAL MACERALS ON BIOMETHANE PRODUCTION

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Abstract

In order to investigate the influence of coal macerals on biomethane production, two types of coal samples were collected respectively from Malan mine in Gujiao and Shaqu mine in Liulin, Shanxi. The vitrinite, inertinite and liptinite were separated by the methods of hand picking and float-and-sink test. Meanwhile, biomethane production experiments using the raw coal samples, vitrinite-rich coal samples, inertinite-rich coal samples as substrates were carried out in the laboratory. Finally, the fourier transform infrared spectrometer (FTIR) was used to analyze the relationship between the macerals and biomethane production. The results show that vitrinite-rich coal samples have the largest biomethane production followed by raw coals samples and inertinite-rich coal samples. Vitrinite-rich coal samples have the highest contents of aliphatic hydrocarbon and lowest degree of aromatization, while inertinite-rich coal samples have the least contents of aliphatic hydrocarbon and highest degree of aromatization. Therefore, the contents of aliphatic hydrocarbon and aromatization degree in coal with different macerals are important indicators of influencing the biomethane production potential.

Key words: biomethane, coalbed methane, degree of aromatization, functional groups, macerals

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