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The effect of moisture on carbon dioxide adsorption of a South African coal

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Abstract

The CO_2 adsorption capacity of moist South African Coal was tested. The coal used in the research was a typical power generation coal from the Witbank coalfield. There is a deficiency of research into CO_2 adsorption capacity of large particles of South African coal with varying moisture content. Moisture in coal will decrease the available sites for adsorption. A volumetric adsorption system commissioned at the University of the Witwatersrand was used to determine CO_2 adsorption of South African coal. The results showed that moisture content in coal affected adsorption capacities for pressures up to 80 bar. Particle size also negatively affected adsorption capacity with large particles adsorbing less CO_2 than smaller ones. In addition, preliminary testing of CO_2 desorption from coal with adsorbed CO_2 into distilled water indicated that this should be explored further.

Key Words

CO_2 Adsorption Capacity, South African Coal, Moisture, Large Particles