

## **Nuclear Magnetic Resonance Spectrum Experiment of Gas Adsorption and Desorption in Coal under Tridimensional Load and Unload**

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### **Summary**

Nuclear Magnetic Resonance (NMR) as an advanced non-damaged measurement technique was introduced into the research of gas adsorption and desorption in coal to simulate physically and evaluate influence of tridimensional load and unload. Coal is typical heterogeneous material which can adsorb gas. Load and unload condition play important roles for gas storage and transport in coal. Gas in coal has two states, free and adsorbed which act balance dynamically. The home-made triaxial osmoscope made up of non-magnetic polycarbonate material which has coal sample were placed into the magnetic bore of NMR spectrum equipment. The NMR spectrum experiments of coal sample were made under different load and unload conditions. With the variation of pore pressure, confining pressure and axial pressure, the shape of NMR spectrum also changed. The peak value variation of adsorption and free gas can be defined as quantity index such as the adsorption peak value decreased 13% when pore pressure from 1.2MPa to 1MPa keeping 1.4MPa confining pressure and 1.3MPa axial pressure. The results show that pore pressure is main influenced factor for gas adsorption and desorption in coal.

