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Experimental study of the effects of sub- and super-critical CO<sub>2</sub> saturation on the mechanical characteristics of organic-rich shales

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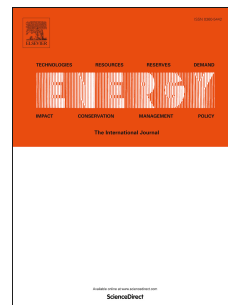
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1 **Experimental study of the effects of sub- and super-critical CO<sub>2</sub> saturation on the**  
2 **mechanical characteristics of organic-rich shales**

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13 **Abstract**

14 The interaction between carbon dioxide (CO<sub>2</sub>) and shale during the process of CO<sub>2</sub> sequestration and  
15 shale gas recovery could significantly affect mechanical properties of the shale. In the current study,  
16 we performed experiments on shale samples at 38□ from the Sichuan Basin aiming at investigating  
17 the effects of sub-critical CO<sub>2</sub> (SubCO<sub>2</sub>) and super-critical CO<sub>2</sub> (ScCO<sub>2</sub>) saturation on shale mechanics.  
18 Uniaxial compressive strength (UCS) test, X-ray diffraction (XRD) analysis, energy dispersive X-ray  
19 spectroscopy (EDX) analysis and acoustic emission (AE) analysis were conducted on the raw and  
20 CO<sub>2</sub>-saturated (4, 6, 8, 12 and 16MPa) shale samples. Results indicate that SubCO<sub>2</sub> saturation (4 and 6

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