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Experimental investigation for predicting compressive strength of sandstone

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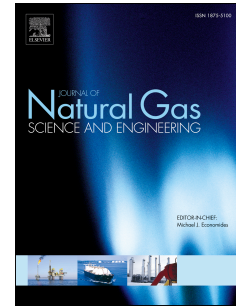
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1 **Experimental Investigation for Predicting Compressive**

2 **Strength of Sandstone**

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5 Uniaxial Compressive Strength (UCS) is an important parameter in petroleum-related rock mechanics, especially
6 drilling operations and production. The lack of appropriate core specimens for laboratory experiments is often a
7 serious obstacle for any geomechanical investigations. Therefore, fast and continuous estimation of UCS based on
8 other accessible data is highly appreciated.

9 The purpose of this study was to verify the most important contributing parameters for estimating UCS of sandstone.
10 Therefore, we established a collection of hundreds of published data plus authors' experimental data. Then we
11 followed a statistical approach based on credible views concerning engineering characteristics of sandstone.
12 Accordingly, we realized that both porosity and Young's modulus significantly affect UCS of sandstone. However,
13 estimation of UCS based on ϕ or E individually, often gives large error, while it may be valid over a limited range of
14 data. Based on statistical analysis of lab experiments on core samples obtained from a wide range of geographical
15 locations, a prediction equation was derived with considerable improvement in error values in comparison with
16 previous correlations.

17 **Keywords** Uniaxial compressive strength, Young's modulus, Porosity, Sandstone, Poroelasticity

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