

## GEOSCIENCES AND REMOTE SENSING

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GEOCHEMISTRY, ENVIRONMENTAL CHEMISTRY AND  
ATMOSPHERIC CHEMISTRY

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**Empirical relationships between geomechanical parameters in one of the oil field, Persian Gulf, Southeastern Iran****Ghafoori Mohammad**

Ferdowsi University of Mashhad, Iran

Measurement of geomechanical properties of rocks, especially static properties, is a timeconsuming and costly process and requires the preparation of samples. Therefore, indirect methods such as ultrasonic and physical tests are often used to predict the geomechanical properties such as uniaxial compressive strength (UCS), static Young's modulus ( $E_s$ ) and Poisson's ratio. In this paper, Ilam formation in one of the oil field in Persian Gulf, has been studied. Formation lithology in the study area is mainly composed of Cretaceous limestone and clay limestone. Core analysis for investigation of structural elements was conducted in large scale. In order to determine the geomechanical properties of reservoir rocks, uniaxial compressive strength, physical and ultrasonic tests were conducted on 28 core specimens. According to the collected data, empirical relationships for predicting of UCS,  $E_d$  and Poisson's ratio were achieved and compared with previous results for limestone. Also, the UCS values obtained from the tests were compared with the UCS predicted values from  $V_p$  and  $E_d$  respectively. Consequently, advisable method for estimating UCS was investigated afterward, the  $E_s$  values achieved from the test results were compared with the predicted values of  $E_s$  from  $V_p$ ,  $E_d$  and UCS. Then the most appropriate method for estimating  $E_s$  was investigated. According to the comparisons, if ultrasonic and density data are available, estimation of the UCS value based on  $E_d$  is recommended. As well as, estimating the  $E_s$  values from UCS is also more precise.

**Biography**

Mohammad Ghafoori is the Professor of engineering geology and rock mechanic at Geology Department, Ferdowsi university of Mashhad, Iran. He obtained his PhD in rock mechanic from Sydney University, Australia under the supervision of the Professor JP Carter and Professor D. W.Airey in 1995. He has published more than 300 papers.

ghafoori@um.ac.ir

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