



المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك سعود
كلية العلوم



**3rd
Saudi Science Conference" New
Horizons in
Science and Their Applications"**

Abstracts

**College of Science
King Saud University
P.O. Box 2455 Riyadh 11451
Kingdom of Saudi Arabia
10th - 13th March/2007**

Evaluation of Some Sandstone Outcrops in Saudi Arabia for Potential Use in Applied Studies of Petroleum and Natural Gas Engineering

Musaed N. J. Al-Awad*; **Abdulrahman A. Al-Quraishi****; **Omar A. Al-Misned **** and **Kamal A. Haroon***

*Petroleum and Natural Gas Engineering Department, College of Engineering, King Saud University, Riyadh, ** Astronomy and Geophysics Research institute, Petroleum and Gas Center, King Abdul Aziz City for Science and Technology, Riyadh*

Core samples are a vital constituent in petroleum and natural gas engineering research activities. Newly developed techniques or theories for solving problems or improving process in petroleum and natural gas engineering must be verified in laboratory using fairly homogenous core samples. Currently, the worldwide practice, is to import homogenous sandstone core samples from abroad (such as Berea sandstone from USA and Clashach sandstone from UK). The cost of importing such core samples is very high and time consuming.

Properties of the selected sandstones were thoroughly investigated by studying the geology, location accessibility, availability, values and ranges of the physical properties (k and \sim), mineralogy (% clay content and type), rock quality designation (RQD), grain size distribution, pore size

Mineralogical investigation indicates that, Urn Assha'al and Sarah sandstones are mainly composed of quartz and small amounts of Hematite and kaolinite, while Saq sandstone is mostly composed of quartz. Average absolute permeabilities, porosities and standard deviations of Urn Assha'a, Saq and Sarah are 6.2 darcy (SD=1.1 darcy), 0.841 darcy (SD=0.37 darcy), 0.183 darcy (SD=0.2 darcy), 29% (SD=1.87%), 22.5% (SD=2.65%) and 27% (SD=0.46%) respectively for the studied rocks.

Based on the above results, Urn Assha'al was used to perform sand production test study, Saq sandstone was used in performing permeability-stress- production rate relationship test study, and Sarah sandstone was used in performing oil recovery improvement by water flooding example study.