

## The effect of shale content to reservoir properties using Synthetic Core Plug Analysis

NUR KHALISA BINTI ABDUL HAMID<sup>1</sup>, NUMAIR AHMED SIDDIQUI<sup>1,2</sup> & ASIF ZAMEER<sup>1</sup>

<sup>1</sup> Institute of Hydrocarbon Recovery, Universiti Teknologi PETRONAS, Perak Malaysia

<sup>2</sup> Department of Petroleum Geosciences, Universiti Teknologi PETROANS, Perak, Malaysia

Email address: khalisahamid@gmail.com; numair.siddiqui@utp.edu.my

**Abstract:** The quality of a reservoir is determined by its hydrocarbon storage capacity and deliverability. Hydrocarbon storage capacity depends on the effective porosity, whereas the deliverability is a function of permeability. Thus, this research project will analyze how different degree of shale content in sandstone will affect the porosity and permeability in order to understand reservoir behavior. The selected area to represent the shale and sandstone core plug samples is in Batu Gajah formation which is part of the Kinta Valley and is rich in sandstone, mudstone and shale. In this research, different approaches

like, X-Ray Diffraction (XRD) analysis, Surface Area Analyzer and Porosimetry System (SAP), Poroperm Test and TinyPerm II Test are adopted to describe how shale contamination effect the reservoir properties. Results obtained from different approaches are used to predict the reservoir behavior. These experiments indicate that higher degree of shale present in a sandstone reservoir will reduce the interconnected porosity between the grains thus, decreasing the permeability as well. This is because the fine shale particles will occlude most of the available pore space.