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Studying limestone pores using Small Angle Scattering techniques

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Limestone is a calcareous rock and is among the common hydrocarbon reservoirs (others being dolostone, sandstone and unconsolidated sands). Carbonate reservoirs hold a significant percentage of the world's oil and gas reserves. This study explores the nanopore structure of calcitic and dolomitic limestone by virtue of them being abundant in the chosen area of study. The difference between these two types of limestones is their magnesium carbonate content, calcitic limestone has about 5% of magnesium carbonate while dolomitic limestone has about 40%. By characterizing the nanopore structure, the intent is to determine the fluid transport capabilities of the limestones under study. The results of the study will be beneficial to the energy resources exploration and add on to the understanding of pore systems in limestone.

A reservoir, body of porous rock that contains fluids (water and/or hydrocarbons) and in which these fluids can migrate, is controlled by two key properties, which are porosity and permeability. These properties are further influenced by other parameters such as pore size, pore diameter, pore throat radius, pore coordination number and pore size distribution.

This presentation gives an account of sample preparation of the limestones for analysis using small angle scattering (SAS) techniques, small angle light scattering (SALS) and small angle x-ray scattering (SAXS) in particular. SALS can structurally characterize materials with pore diameters in the sub-micron range and SAXS is effective in characterizing nano-range structured materials.

Apply to be considered for a student ; award (Yes / No)?

No

Level for award;(Hons, MSc, PhD, N/A)?

N/A

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