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Thermogenic Wet Gas in Immature Caprock Sections: Leakage or Generation.

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Gas geochemistry, an aspect of Petroleum Geoscience is a growing science, various concepts has been used to evaluation potential source rock for shale gas while in conventional petroleum exploration similar concepts have been used to determine potential productive formation for liquid hydrocarbons. Prior to the present times, headspace gas data had been used to recognize by pass pays, serve as indicators of petroleum accumulations, evaluate maturity and productive capacity of corresponding formations, evaluate the maturity and source of gas accumulations. Integrating studies in bid to achieve high degree of accuracy, data on direct hydrocarbon indicators (DHIs) such as oil stains, oil shows and seeps have been employed. Currently popular among professionals is the use of gas clouds on seismic cross sections. In contemporary times, advancement in gas geochemistry has witnessed the application of concepts on headspace gas to expound the efficiency of petroleum caprocks whose major role is to foster accumulation and preservation. This enables extricating potential leakage mechanism via caprock reservoir interface and unravel its corresponding migrational pathways. In this study thermogenic wet gas has been used as a dependable tool for delineating caprock leakage by discriminating migrant from indigenous hydrocarbons in caprock rock sections overlying the reservoirs. The thermogenic gas profile in corroboration with the thermogenic signature and maturity data were used. Summary statistics indicates that 60% of the 50 wells studied has wet gas up to 500m above the reservoir-caprock interface and 10% of the leaking wells are fracture prone leakage.The amount of wet gas ranges of up to 200,000 ppm in the caprock sections, this indicates pervasive leakage. Log view plots were modelled using Schlumbergers' Techlog, while descriptive lithologies were modeled using Zetawares' genesis.