# Geochemical Characteristics and Prospectivity of the Gases from the Veracruz Basin, Mexico

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## ABSTRACT

**The Veracruz Basin is located in the central-eastern part of Mexico, between the Sierra Madre Oriental, Transmexican Volcanic Belt and the Gulf of Mexico, covering around 40,000 km$^2$. The sedimentary column consists of Mesozoic carbonates and Tertiary siliciclastic rocks, reaching a maximum thickness of 12 km in its depocenter. This study integrates the analytical results of 150 gas and condensates samples from 70 wells. Implementation of basic isotopic techniques combined with high resolution methods identifies compositional variations in the origin, maturity, and thermal evolution of gases. Detection of biogenic gas in commercial volumes suggests the presence of favorable anoxic conditions for generation and accumulation in the Miocene-Pliocene depocenters. The source rock potential and its correlation with the basin hydrocarbon resources of the basin was analyzed determining their genesis. The molecular analysis of gases integrated to the geologic context, allowed their correlation with deep-generating source rocks, and gives an idea about their generation, accumulation, and geographical and stratigraphical occurrence. The petroleum system modeling suggests that the main thermogenic gas generation-expulsion started at Late Miocene, filling structural and stratigraphic traps. The calculated migration efficiency predicts the presence of huge deep gas accumulations not yet explored.**

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