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Marcos A. L. Nascimento¹, Zorano S. Souza¹ (1) Universidade Federal do Rio Grande do Norte (Federal University of Rio Grande do Norte), Natal, Brazil

The Cabo Magmatic Province and its relationship in the generation of oil and gas in the Pernambuco Basin (Northeastern Brazil)

The Cabo Magmatic Province (CMP) is situated on the northeastern coast of Brazil, as one unit of the Pernambuco Basin, and it is limited with Precambrian terranes to the west and Cenozoic sediments of the coastal zone to the east. It is composed of trachyte, rhyolite, basalt, ignimbrite and alkali-feldspar granite, comprising dikes, lava flows and plugs, which range in age from Albian to Turonian.

The proximity with the Pernambuco Lineament, as well as with the faults that demarcate the rift stage of the Pernambuco Basin, suggests a Precambrian structural control in CMP in the geometry of this basin. The distribution of the volcanic activity probably has a tectonic control. Near the faulted basin border and the Pernambuco Lineament, the rocks are predominantly of basic composition, whereas to the south and east they become more acid.

The presence of those cretaceous (or still younger) magmatic suites, with its thermal input to the basin, may have favoured the generation and/or remobilization hydrocarbon. The diagenetic and depositional history of sediments of the Cabo Formation was highly affected by magmatic activity. It is possible to observe silicification and illitization processes of the sediments that are in contact with the volcanic rocks, mainly in wells data.

Future research can furnish arguments for a better understanding of the magmatic geology of the Pernambuco Basin, as well as the understanding of the remobilization and maturation of fluids in function of the heating due to the Cretaceous magmatism, especially the effects produced in oil and gas fields.