



PROCESSES OF MUD VOLCANISM IN THE BARBADOS-TRINIDAD COMPRESSIONAL SYSTEM (SE CARIBBEAN): NEW STRUCTURAL AND GEOCHEMICAL DATA

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A large active belt of mud volcanoes and shale diapirs is widely developed from the onshore Trinidad toward the southern part of the Barbados prism. This has been notably spectacularly evidenced by the CARAMBA survey of the O/V ATALANTE in 2002 in the southern part of Barbados prism where mud volcanoes are well developed along ramp anticlines and on top of sigmoid rises of mud diapirs. The mobilized sediments expelled by the mud volcanoes are fluidized argillaceous and sandy material issued from deep horizons and various shallower formations pierced by the mud conduits. In Trinidad, nanofossils assemblages found in the mud and the clasts outline that the material is clearly originating from several levels from the Early Cretaceous (Barremian) to Late Miocene (and not only from the Miocene as previously thought), whereas in the Barbados prism, the older mobilized sediments found are Miocene in the front of the prism and Eocene-Oligocene in the core of the tectonic wedge. Both, in the Barbados prism and in Trinidad, the mud expelled is rich in thin angular and mechanically damaged quartz grains related to shearing and/or hydraulic fracturing processes. The exotic clasts result mostly from hydraulic fracturation. In Trinidad, the gas phase is mainly thermogenic methane (associated with moderate concentrations in C^2+ and CO_2). This implies a deep origin of the gas, probably deeper than 5000m. The dryness of the gas would be due to segregation processes (solubility/diffusion in

water) which probably occurred during the mud rising. The concentration in C_2+ is higher in the sites where eruptions occurred recently. The analysis of noble gas radiogenic isotopes show that the residence time is shorter for the gas expelled by the mud volcanoes than for the gas within the HC fields. So the gas of the mud volcanoes is not issued from leakage from the HC fields, but would come directly from deep kitchens.