

GEOCHEMICAL COMPOSITION OF BEACH TAR FROM THE SE COAST OF THE PARIA PENINSULA, NE VENEZUELA: DERIVATION FROM NATURAL SEEPAGES

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Tar residues (“tarballs”) occur frequently on the SE coast of the Paria Peninsula, NE Venezuela. This paper reports on tarballs recovered from approximately 14 km of shoreline during monthly sampling over a two-year period ending in April, 2011. The tarballs were analysed geochemically and results show that more than 70% of them could be included within a single compositional group on the basis of their physical and organoleptic properties. The tarballs were fingerprinted using biomarkers (hopanes, steranes, alkanes, aromatic steroids, phenanthrenes and dibenzothiophenes) by gas chromatography and gas chromatography – mass spectrometry. Sulphur and trace element contents were also determined. These analyses indicate that the tarballs do not have an anthropogenic origin, but that they probably originated from petroleum generated by argillaceous limestones in the Turonian – Campanian Naparima Hill Formation. This formation includes marls and organic-rich shales and limestones, and is an important source rock at oilfields in Trinidad and the southern Gulf of Paria. In the southern part of the Gulf, petroleum escapes from Neogene reservoirs to the seafloor via natural seepages associated with the Los Bajos and other fault systems. It is inferred that the petroleum is then transported by wind and tidal currents to the coast of the SE Paria Peninsula where it strands as tarballs. The geochemistry of the tarballs collected is discussed to investigate their source.

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