

Comparative Analytical Methods for the Monitoring of Polyaromatic Hydrocarbons in Nigerian Crude Oil.

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Abstract:

This study involves the use of comparative analytical techniques for the monitoring, determination and characterization of poly-aromatic hydrocarbon compounds found in Nigerian crude oils collected from Bonny, Brass, Escravos, Forcados, Pennington and Qua-Iboe Terminals. The analytical approach adopted involved the use of conventional fluorimetry, synchronous excitation, nuclear magnetic resonance, high performance liquid chromatography coupled to ultraviolet and fluorescence detectors, and gas chromatograph - mass spectrometry techniques. Certain physicochemical measurements of the crude oils such as viscosity, elemental analysis, specific gravity and refractive index were also measured.

All the crude oil samples from the seven terminals were found to contain about the same number of isomeric polynuclear hydrocarbons, for instance, the major isomeric compounds found in most of the crude oils analysed were carbazole, benzofluorene, naphthalenes, phenanthrenes, anthracenes, benzo(a, b, c)pyrenes, C1- C3 alkylbenzenes, and C1 - C4 alkyl naphthalenes. From the results obtained an average of forty polynuclear aromatic hydrocarbons could be classified as priority pollutants in the Nigerian crude oil.

Among the techniques used, HPLC-UV happens to be the most suitable technique in that many more compounds were identified relative to other techniques such as GC - MS, fluorescence, However, the GC - MS result obtained from Ebubu flow station sample was used as a confirmatory guide to the comparative analytical techniques employed in this study .

Keywords: Poly-aromatic hydrocarbon compounds/ crude oil

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