

Gas chromatography- mass spectrometry (GC-MS) profiling of polycyclic AROMATIC hydrocarbons (pahs) and their human health risk assessment in surface waters from a rural community in Anambra, South East-Nigeria

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Abstract

This research investigated the levels of Polycyclic Aromatic Hydrocarbons (PAHs) in different streams from Ifite Ogwari, Ayamelum Local Government Area of Anambra State. The streams are Isiachala (A), Iyiutu (B), Ube (C), Ahala (D) and Tabasi (E). The aim was to determine the levels of PAHs in the streams and conduct human risk assessment of the pollutants. The water samples were collected using precleaned 500 cm³ glass bottles and were analyzed for the presence of 16 USEPA PAHs using Gas Chromatography - Mass Spectrometry (GC-MS). Ecological risk model to determine contamination factor, degree of contamination and pollution load index was employed. Human health risk assessment (hazard index and total cancer risk) was conducted. The results showed the presence of naphthalene, chrysene, benzo [a] pyrene and benzo [ghi] pyrene in all the samples. Fluoranthene and dibenzo [a,h] anthracene were present in samples A and B only. Pyrene was detected only in sample B while there was presence of benzo [b] fluoranthene in samples A, B, D and E. Benzo [a] anthracene and benzo [k] fluoranthene were present in samples A, B and C. The cumulative PAHs values for samples A, B, C, D and E were 160.99ng/ μ l, 194.67 ng/ μ l, 105.60 ng/ μ l, 157.97 ng/ μ l and 68.74 ng/ μ l respectively. Correlation showed strong relationship with benzo[a] pyrene, next to chrysene, as pareto chart showed that chrysene was dominant across all samples with over 80% cumulative variance at $p > 0.05$.

Biography

Okafor V N was borne on 15th January, 1976 into the family of Late Mr. and Mrs. Udebunu and Agatha Nwaodu Okafor. He obtained his first degree in Industrial Chemistry from the prestigious University of Nigeria and completed his PhD in 2016 from Nnamdi Azikiwe University, Awka, Nigeria. He has published in both local and international reputable journals, attended both local and international conferences where he presented academic papers. He received the Vice Chancellor's best PhD student price as the best graduating student with a perfect grade of 5 point on a scale of 5 during the 2016/2017 convocation ceremony of the University. Vincent is currently the coordinator of Industrial/Analytical/Environmental Chemistry research group in the Department of Pure and Industrial Chemistry, Nnamdi Azikiwe University, Awka, Nigeria.



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