INTERPRETATION OF ENVIRONMENTAL DATA USING CLUSTER ANALYSIS. CASE STUDY: BTEX AND PAH IN SEDIMENT SAMPLES OF PATOKU LAGOON

Aurel Nuro[1], Elda Marku[2], Bledar Murtaj[3], Kujtim Dule[4], Alda Kika[5], Valbona Hoxha (Plaku)[6]

[1]Chemistry Department, Faculty of Natural Sciences, Tirana University, Albania,
E mail: aurel.nuro@fshn.edu.al
[2]Mathematic Department, Faculty of Natural Sciences, Tirana University, Albania,
[3]Informatics Department, Faculty of Natural Sciences, Tirana University, Albania,
[4]General and Inorganic Chemistry Department, Polytechnic University of Tirana, Albania

Abstract

This paper presents data for determination of benzene, toluene, ethyl benzene and xylene (collectively known as BTEX) and PAH (poly aromatic hydrocarbons) in sediment samples of Patoku Lagoon. This lagoon is one of the biggest lagoons in Albania. Fifteen sediment samples were taken in different stations of the lagoon in October 2013. Headspace solid phase micro extraction (HS-SPME) technique was used to trace BTEX in sediment samples. Polydimethyl Siloxane fibers were used for the adsorption - desorption process from sediment samples. Ultrasonic extraction was used for the isolation of PAH (assisted with hexane as an extraction solvent). 10 g of sediment samples were taken from each of the stations of Patoku Lagoon. The analysis of the BTEX and PAH was performed separately by the gas chromatography technique using flame ionization detector (GC/FID) with VF-1ms capillary column (30m x 0.33mm x 0.25um). The relative concentrations of BTEX were Benzene > Toluene > Xylene > Ethyl benzene > Acenaphtalene. The presence of volatile organic pollutants could be mostly from automobilist transport near the lagoon, water currents and the discharge of industrial wastes in Mati River. The results of surveillance on monocyclic hydrocarbons pollutants were interpreted using the Cluster Statistical Method.

Keywords: *BTEX; HS-SPME; Sediment sample; Patoku Lagoon; Cluster Analyze; GC/FID*

The 2 nd International Conference on Research and Education – "Challenges Toward the Future" (ICRAE2014), 30-31 May 2014,

University of Shkodra "Luigj Gurakuqi", Shkodra, Albania