

Investigation of contamination of Bushehr coastal sediments to the Polybrominated Diphenyl Ethers (PBDEs)

Project manager: **Ali Mehdinia**

Contributor: **Vahid Aghadadashi, Iman Arebi, Ehsan Abedi**

Abstract

Polybrominated diphenyl ethers (PBDEs), which are used as additives and flame retardant to prevent rapid combustion of the products, are persistent organic pollutants that their presence in biota and biotop has caused the serious concerns in academic societies. According to that there was no report on the levels of these compounds in the Iranian coast of the Persian Gulf. Sampling was performed from sediments of six stations located in the coastal area of Bushehr city. The samples of each area were taken by Van-Veen grab at 500, 1000 and 1500 meters from the beach. The concentration ranges of BDE-209 and \sum BDEs were 0.03-4.5 ng g⁻¹ and 0.01-0.62 ng g⁻¹ (dry weight), respectively. Comparing these values with the corresponding values in other parts of the world shows that the coastal area of Bushehr had a low level of contamination to the PBDEs. BDE-209 and BDE-183 were the dominant components of PBDEs and BDE-154, BDE-99, BDE-28, BDE-47 and BDE-100 concentrations were in the following order of rank. The maximum concentration levels of BDE-209 were observed in the stations with 500 m away form the beach, but the total concentration of other compounds did not follow this trend. Also, the precipitation pattern of PBDEs in the studied area did not follow the patterns of total organic

carbon changes and grain size of sediments. Dramatic reduction in the concentrations of BDE-208 with increasing distance from the beach may be due to the highly hydrophobic nature of this compound in aqueous media and also its strong tendency for rapid removal from the water column. Shaghab station showed the highest amount of contamination among the other stations. Halileh was the second station in terms of pollution. The results showed that the contamination of Bushehr coastal area to PBDEs can be originated from spot sources located on the beach and they are not originated from atmospheric depositions. Investigation of the isomers compositions showed that the most commercial compounds used in the products of studied area were deca Brominated compounds. This finding shows the possible origins of the PBDEs in the studied area are textiles and polymers.

Keywords

Polybrominated diphenyl ethers (PBDEs), Bushehr, Sediment, Total Organic Carbon, Grading.