



Assessment of the PCDD/F pollution in the surface water and sediments in Izmit Bay and Sapanca Lake (Turkey)

A. Karademir, E. Durmusoglu, M. Bakoglu

Dept. of Environmental Engineering, University of Kocaeli, 41040, Kocaeli, Turkey

Surface water and sediment samples collected from four points along the north coastline of the Izmit Bay (at the east of Marmara Sea) and from the four points in the Sapanca Lake (~ 30 km east of the Izmit Bay) were analyzed for 2,3,7,8-substituted PCDD/F congeners and homologues by using HRGC/HRMS. Average PCDD/F concentrations in sediment samples from the Izmit Bay and the Sapanca Lake were determined as 9.56 and 0.93 ng WHO-TEQ/kg dw, respectively, showing the effect of dense industrialization taken place in the last 40 years in the Izmit Bay and surroundings. The PCDD/F concentrations in the surface water were 0.36 and <0.17 pg WHO-TEQ/l for the Izmit Bay and the Sapanca Lake, respectively. A simple reservoir model based on the inputs and the consequent sediment-water partitioning of PCDD/Fs produced excess of PCDFs, especially OCDF, indicating additional loadings from the chlorine industry. The high concentrations of OCDF in sediments from the Izmit Bay were attributed to the discharges from a large petrochemical complex with many chemical processes including vinyl chlorine monomer (VCM) production, and a chlor-alkali plant. Although the VCM production was finally ceased and the chlor-alkali plant was closed down due mainly to the environmental concerns in 1990s, the “chlorine fingerprint” in the PCDD/F profiles in sediments showed the effect of 30-years-long discharges prior to that date.