

Distribution of Gamma-Radiation Levels in Core Sediment Samples in Gulf of İzmir, Eastern Aegean Sea, Turkey

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Abstract : After development of the industrial revolution, industrial plants and settlements have spread widely on the sea coasts. This concentration also brings environmental pollution in the sea. This study focuses on the Gulf of İzmir where is located in West of Turkey and it is a fascinating natural gulf of the Eastern Aegean Sea. Investigating marine current sediment is extremely important to detect pollution. Natural radionuclides' pollution of the marine environment which is also known as a significant environmental anxiety. Ground drilling cores (the depth of each sediment is variant) were collected from the Gulf of İzmir's four different locations which were Karşıyaka, İnciraltı, Çeşmealtı and Bayraklı. These sediment cores were put in preserving bags with weight around 1 kg, and they were dried at room temperature in a week for moisture removal. Then, they were sieved with 1 mm sieve holes, and finally these powdered samples were relocation to polyethylene Marinelli beakers of 100 ml versions. Each prepared sediment was waited to reach radioactive equilibrium between uranium and thorium for 40 days. Gamma spectrometry measurements were settled using a HPG (High- Purity Germanium) semiconductor detector. Semiconductor detectors are very good at separating power of the energy, they are easily able to differentiate peaks that are pretty close to each other. That is why, gamma spectroscopy's usage is common for the determination of the activities of U - 238, Th - 232, Ra - 226, Cr - 137 and K - 40 in Bq kg⁻¹. In this study, the results display that the average concentrations of activities' values are in respectively; 2.2 ± 1.5 Bq/ kg⁻¹, 0.98 ± 0.02 Bq/ kg⁻¹, 8 ± 0.96 Bq/ kg⁻¹, 0.93 ± 0.14 Bq/ kg⁻¹, and 76.05 ± 0.93 Bq/ kg⁻¹. The outcomes of the study are able to be used as a criterion for forthcoming research and the obtained data would be pragmatic for radiological mapping of the precise areas.

Keywords : gamma, Gulf of İzmir (Eastern Aegean Sea-Turkey), natural radionuclides, pollution

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