

Apparent depth-imaging analysis for refractive index measurement

ABSTRACT

Sediment can accumulate trace elements in the environment. This study profiled the magnitude of As, Ba, Cd, Co, Cu, Cr, Ni, Pb, Se, and Zn pollution in surface sediments of the west coast of Peninsular Malaysia. Trace elements were digested using aqua regia and were analyzed using the inductively coupled plasma-mass spectrometry. The extent of elemental pollution was evaluated using with the enrichment factor (EF) and geoaccumulation index (Igeo). This study found that the elemental distribution in the sediment in descending order was Zn > Ba > Cr > Pb > Cu > As > Ni > Co > Se > Cd. Zn concentrations in all samples were below the interim sediment quality guideline (ISQG) (124 mg/kg). In contrast, Cd concentrations (2.34 ± 0.01 mg/kg) at Station 31 (Merlimau) exceeded the ISQG (0.70 mg/kg), and the concentrations of As in the samples from Station 9 (Tanjung Dawai) exceeded the probable effect level (41.60 mg/kg). The Igeo and EF revealed that Station 9 and Station 31 were extremely enriched with Se and Cd, respectively. All stations posed low ecological risk, except Station 31, which had moderate ecological risk. The outputs from this study are expected to provide the background levels of pollutants and help develop regional sediment quality guideline values. This study is also important in aiding relevant authorities to set priorities for resources management and policy implementation.

Keyword: Ecological risk index; Enrichment factor; Geoaccumulation index; Interim sediment quality guideline; Trace element pollution