

The history of petroleum pollution in Malaysia; urgent need for integrated prevention approach

ABSTRACT

Petroleum pollution is known as point and non-point source of contaminations in the environment. A major class of petroleum contaminant is groups of compounds consist of two or more fused benzene rings called polycyclic aromatic hydrocarbons (PAHs) that are carcinogenic, mutagenic and toxic. Source identification of petroleum pollution is necessary to prevent pollution entry into the environment. Eight sedimentary cores were obtained from developed and developing areas around Peninsular Malaysia to investigate the historical profile of PAHs, their characteristics and its possible origins. The results showed that the PAHs concentrations varied from very minimum to 2400 ng/g d. w. in average quarter century intervals. Most of the studied locations showed high contribution of PAHs from combusted fuel, coal, biomasses and wood materials except for the southern part of Peninsular Malaysia in which revealed dominance of petroleum products. The findings indicate that PAHs are delivered from different intermediate materials such as asphalt, street dust, vehicular emission and crankcase oil. However, there has been a decline of PAHs input into the marine environment in recent years; petroleum is shown to be a significant cause of marine pollution since the second quarter of 20th century. An overview on sourced materials of petroleum pollution indicates multi-approach necessity toward pollution control, regardless of concentration and possible degradation processes. Various sectors both governmental and non-governmental are needed for prevention and control of petroleum pollution where different sources apparently contribute to the pollution generation process.

Keyword: Petroleum pollution; Source identification; PAHs; Integrated management; Malaysia