

The level of metals and organic contaminants in sediments of coastal area in Korea

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This study was conducted in order to know the levels of the metals and organic contaminants in surface sediments of coastal area in Korea. A total of 10,576 samples for 8 metals (As, Cd, Cu, Cr, Ni, Hg, Pb and Zn) and 24 organic compounds (OCPs, PCBs, PCDD/Fs, DEHP and 14 PAHs) from 35 papers (1997 ~ 2011) and a series of research reports (2000 ~ 2008) about this study were investigated. The contents of metals in sediments were mainly controlled by the grain size of the sediments except part of areas contaminated contained higher contents than normal values. But the investigation of organic compounds showed no significantly correlation with TOC. The threshold effect level (TEL) and probable effect level (PEL) were adopted to assess the level of the contaminants. Overall the average and range of concentrations of metals (mg/kg) in the surface sediments were: As (8.7, 0.031 ~ 46.3), Cd (0.41, 0.002 ~ 12.5), Cr (61.4, 0.04 ~ 757), Cu (53.9, 0.12 ~ 5336), Hg (0.08, 0.0002 ~ 3.34), Ni (28.1, 0 ~ 121), Pb (41.01, 0.06 ~ 733) and Zn (144, 2.37 ~ 2447). Mean concentration of organic compounds ranged from 0.155 ng/g (γ -HCH) to 384 ng/g (Σ PAHs). The sites for metals exceeding the TEL ranged from 22 % (Ni, 22/99) to 87 % (Cu and Cr, 86/99), and from 0 % (As, 0/99) to 19 % (Cu, 19/99) for PEL. At the case of organic compounds, the sites exceeding the TEL ranged from 0 % (6 PAHs and DEHP, 0/66) to 52% (PCDD/Fs, 32/61), and from 0 % (p,p'-DDD, 6 PAHs and DEHP, 0/61) to 41 % (Σ DDTs, 25/61) for the PEL. The results showed that the sites exceeding the TEL and PEL of chemicals in the surface sediments of coastal area in Korea mainly concentrated in the harbours and the industrial complex.