

## **Fractionation and risk assessment of metals in the sediments of ocean dumping sites, Rep. Of Korea**

J.M. JUNG<sup>1,2,\*</sup>, S.H. KIM<sup>1,2</sup>, K.Y. CHOI<sup>1</sup> AND  
C.S. CHUNG<sup>1,2</sup>

<sup>1</sup> Korea Institute of Ocean Science & Technology, Ansan  
15627, Rep. of Korea  
(\*correspondence:jungjm86@kiost.ac.kr)

<sup>2</sup> Integrated Ocean Science, University of Science &  
Technology, Daejeon 34113, Rep. of Korea

The sequential extraction procedure of metals by the European Community Bureau of Reference (BCR) was applied to assess the risk of the metal contamination in the sediments of Korean ocean dumping sites located in the Yellow Sea. Core sediment samples were collected in three stations in dumping sites and one reference station. Cr, Ni, Cu, Zn, Cd and Pb were analyzed with ICP-MS and the standard reference material of BCR 701 was analyzed simultaneously with the sample to identify the QA/QC values for this study.

Total concentrations of Cr, Ni, Cu, Zn, Cd and Pb in the sediment of dumping sites showed 423, 46.7, 37.7, 146, 0.58 and 50.2 mg/kg in maximum, respectively. As a result of BCR sequential extraction procedure, Cr, Ni, Cu and Zn were mainly found in the residual fraction (F4) while dominant portion of Cd and Pb were in exchangeable fraction (F1) and in easily reducible fraction (F2) respectively. The portion of Cr in oxidizable fraction (F3) was found up to 70% in the layers of sediment in which total concentration of Cr was enriched. Risk assessment code (RAC) calculated from surface sediments showed a low risk for Cr, Ni, Cu and Pb, however, a medium risk for Zn at dumping sites and for Cd at reference station. Especially, RAC values of Cd at dumping sites were from 69 to 74% in spite of low total concentrations in these regions.