

# Tracing the pollution source using Pb isotopes in sediments of the coastal region surrounding the national industrial complex, Korea

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The input of pollutants from industrial complexes and populated cities in the coastal area caused serious environmental problem such as water quality deterioration and heavy metal contamination. Shihwa and Ulsan industrial complexes are one of the largest national industrial complexes in Korea and contribute 49% of the total national production. Shihwa industrial complex is characterized by the small enterprises and light industry (19,182 facilities) including machinery, electric and electric goods, petrochemicals, textile and automobiles. Ulsan industrial complex is characterized by the large enterprises (1,053 facilities) and heavy industry including shipbuilding, automobile, petrochemical production, ferrous metal, oil refinery retention industries.

The concentrations and isotope ratios (MC-ICP-MS) for Pb in the coastal, stream and road-deposited sediments were investigated to identify the Pb pollution sources from two different national industrial complex areas. The mean of Pb concentration in the road-deposited sediments were higher than those in the coastal and stream sediments from Shihwa and Ulsan areas. For Shihwa area, the mean of <sup>206</sup>Pb/<sup>207</sup>Pb ratios in the coastal, stream and road-deposited sediments were 1.178, 1.150 and 1.148, respectively. Pb isotope ratios tend to decrease with increasing Pb concentrations in sediments. The Pb isotope ratios of coastal sediments nearby industrial complex showed similarity with stream and road-deposited sediments. The results of Pb isotope ratios indicated that the main factors affecting the Pb isotope ratios in Ulsan area was the difference of imported ores sources because several nonferrous metal industries (metal and refinery Co.) exist. While, the potential sources for Pb pollution from Shihwa area was influenced by various lead products.