

Temporal distribution of metals in marine total suspended particulate of the Socheongcho Ocean Research Stations (S-ORS) in the Yellow Sea

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Recently, The significance of continental weathering products input via the atmosphere to the ocean has been highlighted. Atmospheric aerosols of various origins not only cause global climate change by scattering and absorbing light, but also affect the marine ecosystem and human health. The interest of aerosol and marine scientists has turned to Asian dust (Yellow dust) occurring in China and Mongolia. Korea and the Yellow Sea are located relatively close to the source of the Asian dust, which is a geographical situation that is heavily affected.

In order to investigate the pollution level of Asian dust and influence of ocean flow, total suspended particulate (TSP) samples were collected from the top of S-ORS in the Yellow Sea using high volume aerosol sampler (HV-1000F, Shibata, Japan) with Whatman 41 filter paper. A total of 53 TSP samples were collected in 2017. Intensive sampling was conducted in spring (Mar.-May, 44 samples) with frequent Asian dust events. 33 elements were analyzed using a ICP-MS after mixed acid decomposition.

Al showed the highest average concentration (5,041 $\mu\text{g}/\text{m}^3$) and Yb was the lowest average concentration (0.1461 $\mu\text{g}/\text{m}^3$). Overall, the highest metal concentrations were observed at the time of yellow dust, but there was a difference in the highest metal concentrations. The enrichment factor (EF) was more than 10 in 12 elements such as Se, Cd, Sb, As, Sb, Pb, Mo, Zn, Sn, V, Ni, Cu and Tl. Considering the relationship of metal, EF, and electronegativity, the natural origin of rare earth metals dominated. However, some of the transition metals were contaminated artificially.

In the future, additional leaching experiments and chemical analysis of seawater will be conducted on TSP samples to understand marine aerosol chemistry in the Yellow Sea.