

CONCENTRATION DISTRIBUTION OF SOIL PARTICLES  
AND POLLUTANTS IN THE MARINE ATMOSPHERE  
AND THEIR TRANSPORT TO THE OCEAN  
(ABSTRACT)

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In order to investigate the concentration distribution of soil particles and pollutants in the marine atmosphere and their transport to the ocean, atmospheric concentrations of Al, Si, Fe, S and Cl were measured in the Pacific Ocean, the Indian Ocean and the Antarctic Ocean. The marine aerosol samples, collected on board the research ship SHIRASE, were analyzed by X-ray fluorescence analysis. The samples were taken every day by a low volume air sampler at the flow rate of 30 l/min, during the cruises of SHIRASE from Tokyo to Fremantle in November and from Fremantle to Syowa Station in December 1988.

As a result, the average concentrations of the soil derived elements were 11.9 ng/m<sup>3</sup> for Al, 50.6 ng/m<sup>3</sup> for Si and 12.5 ng/m<sup>3</sup> for Fe over the western Pacific Ocean between Tokyo and Fremantle. These values are as low as 1/100 of atmospheric concentration over land except Antarctica. Especially, over the Indian Ocean and the Antarctic Ocean between Fremantle and Syowa Station, concentrations were very low, 6.5 ng/m<sup>3</sup> for Al, 13.4 ng/m<sup>3</sup> for Si and 3.5 ng/m<sup>3</sup> for Fe on an average. It is considered that these values are the background concentrations of soil derived elements in the marine atmosphere.

The main sources of S and Cl in the marine atmosphere are sea salt. Therefore, a strong correlation between concentrations of S and Cl was observed over the Indian Ocean and the Antarctic Ocean. However, over the western Pacific Ocean between Tokyo and Fremantle, a correlation between concentrations of S and Cl was not observed. The concentration of S was highly correlated with that of soil derived elements. The western Pacific Ocean was not far from land including the Asian Continent and Southeast Asia. It is considered that S originated from oil burning in Asia with soil particles. Thus, the marine atmosphere over the western Pacific Ocean is influenced by anthropogenic sources on land.

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