Suspended Particle Dynamics in Surface Water of South China Sea Revealed by "CATNET"- an Ultraclean Sampler

Liang-Saw Wen[1], Wen-Hui Lee[1], and Tung-Yuan Ho[2]
[1]Institute of Oceanography, National Taiwan University
[2]Environmental Change Research Center, Academia Sinica

Abstract

An ultraclean stage filtration system for collection and filtration of suspended particulate matter (SPM) has been developed specifically for trace element biogeochemistry study. Minimization of metal contamination sources was realized by careful choice of materials and designing an in-line "closed–open–closed" procedure for the system. The system has been tested and applied successfully in the South China Sea to sort out the trace metals (e.g., Fe, Pb, Cd, Cu, Ni, Zn, Co) partitioning and distribution on suspended particles in the waters. The analytical possibilities allowed by the large amount of SPM which can be collected by CATNET for total metal concentration, solid speciation and morphological investigation by scanning electron microscopy. Results indicated that diurnal variations of plankton distribution can be easily resolved and identified even though no apparent chlorophyll-a changed were observed. Distributions of trace elements on these fractionated particles were, at times, mainly controlled by the plankton and possible Aeolian inputs found in the region. Chemical analysis of size fractionated particles suggested that the large particles (150μm) were of biological origin, while the smaller particles (10~60μm) were enriched in inorganic materials.