Determination of Acid Volatile Sulfides–Simultaneously Extracted Metal Relationship and Toxicity in Contaminated Sediment Layer in Mid-Black Sea Coasts

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Abstract : Sediment refers to the accumulation of varying amounts of sediment material in natural waters and the formation of bottom sludge. Sediments are the most important sources of pollutants as well as important future sources and carriers of pollutants. The accumulation of pollutants in sediments can cause serious environmental problems for the surrounding areas. Heavy metals (such as Cr, Cd, Al, Pb, Cu, Al, Zn) disrupt the water quality, affect the useful use of sediment, affect the ecosystem and have a toxic effect on the life of the sediment layer. This effect, which accumulates in the aquatic organisms, can enter the human body with the food chain and affect health seriously. Potential metal toxicity can be determined by comparing acid volatile sulfides (AVS) – simultaneously extracted metal (SEM) ratio in anoxic sediments to determine the effect of metals. Determination of the concentration of SEM and AVS is useful in screening sediments for potential toxicity due to the high metal concentration. In the case of SEM/AVS < 0 (anoxic sediment); in terms of AVS biomass production, its toxicity can be controlled. No toxic effects may be observed when SEM / AVS < 0. SEM / AVS > 0 (in the case of oxic sediment); metals with sensitive fraction such as Cu, As, Ag, Zn are stored. In this study, AVS and SEM measurements of sediment samples collected from five different points in the district of Tekkeköy in Samsun province were performed. The SEM - AVS ratio was greater than 0 in all samples. Therefore, it is necessary to test the toxicity against the risks that may occur in the ecosystem.

Keywords : AVS-SEM, Black Sea, heavy metal, sediment, toxicity
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