Investigation of Fe, Pb, Cd and Cu concentrations in sediments of Mighan Wetland using geo-accumulation index

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Received date: 2014.01.20
Reception date: 2014.03.15

Abstract

Heavy metals don't disintegrate by microbial process, are persistent and storage pollutants. Sediments are inseparable fractions of wetland ecosystems that work as a historical archive in record of heavy metal aggregation changes process. So in this research, sediments of Mighan Wetland were evaluated from aspect of quantity of heavy metal pollution. For this purpose, in year of 2013 after review of region, 11 stations were selected random, and in one stage from every station, 3 sediment samples were picked up. After preparing and digesting the sediments, concentrations of evaluating heavy metals in samples were measured by atomic absorption. All statistical analyses were performed using the SPSS 19.0 statistical package. Results showed that average concentration of Fe in all sampling stations had meaningful difference and average concentrations of Pb, Cd and Cu except in several stations, in rest of stations showed meaningful difference. Also, comparing the average concentration of evaluating elements with WHO permissible limits showed more values than standard for iron and copper elements. Finally, with calculating geochemical Muller index, sediments of Mighan Wetland from aspect of all heavy metals pollution, with Igeo value<0, were categorized in unpolluted category. Generally, with attention to results of the research can say that although at the present time, sediments of Mighan Wetland are not polluted with heavy metals, but entrance of urban and industrial wastewaters to the wetland, settlement of Iranian minerals company and Arak refinery stabilization near to it, at long time can pollute the wetland to different pollutants specially heavy metals and cause irreparable damages.

Keywords: Fe, Cu, Pb, Cd, sediment of Mighan Wetland, geo-accumultion index.