Evaluation of the degree of metal pollution in the waters and sediments of the Sidi Hsayen Dam (Morocco)

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In the last decades, more and more attention has been devoted to the investigation of heavy metals pollution in the environment, due to the increasing anthropogenic contribution to the natural sources of heavy metals in the environment.

The presence of heavy metals in water and sediment samples is due to a variety of chemical, biological and physical effects: they can be introduced as dissolved or particulate matter, whatever they are due to natural processes (river flow fluctuations, water drainage, runoff from river banks, leaching of bed rocks) or to the anthropogenic contribution (industries discharging into rivers, urban wastes). The examination of the spatial differences of the heavy metals content of water and sediments allows the identification of the presence of anthropogenic effects, possible sources of contamination and effects due to the transport of pollutants from other areas.

In this work, we report and discuss results of distribution of major and trace elements in water and sediment samples collected from Sidi Hsayen Dam in the region of Tanger (Morocco) using different methods. The methodology undertaken during this work is based on:

(i) monitoring of measurements of physico-chemical parameters of water;

(ii) identification of as many metallic elements from neutron activation analyzes;

(iii) standardization of the elements obtained in relation to the upper continental crust;

(iv) processing of the database by principal component analysis (PCA).

Keywords: Sediments, heavy metals, Sidi Hsayen Dam, neutron activation analyses, principal component analysis, physico-chemical parameters