Poster presentation

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# Rare Earth Element Distribution in a sediment profile from Jurumirim Reservoir, São Paulo State, Brazil, by NAA and ICP-MS

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There is a growing interest in the quantification of contaminants in sediments originating from anthropogenic activities. However, many elements are not commonly monitored in the environment and are being increasingly used in various industrial sectors. Besides heavy metals, the interest in the determination of three rare earth elements especially (Gd, Tb and Yb) has increased considerably over the last few years. Rare Earth Elements (REE), in general, have been widely used in the production of CDs, TVs and as a contrast in Nuclear Resonance Magnetic Imaging Tests. In the present study, the vertical distribution of REE through a sediment core from the Jurumirim reservoir are presented. Its operations for generating electrical energy started in 1962. It drains an area of 17.8 thousand km², with an extension of approximately 100 km in Paranapanema River, and 40 km in the Taquari River. The basin occupation is characterized by a drainage area with 14% occupied by preserved vegetation, and therefore was chosen as a probable reference point for obtaining values that can be used as REE background values for this region. A sediment core with 60 cm depth was collected in January 2013 and sliced at every 2.5 cm. In this study the REE fractionation in the sediment samples by using BCR sequential extraction protocol was performed in order to verify the REE mobility in the environment. For the sequential extraction, four steps (exchangeable, reducible, oxidizable and residual fractions) were studied. The extraction based on the REE solubility in each one of the steps was verified by measuring the REE distribution in each step, by means of ICP-MS technique. The results showed that REE have higher affinity for the reducible phase, always presenting higher concentrations. Instrumental neutron activation analysis (INAA) was also applied to the sediment samples in order to determine the total concentration for some rare earth elements (Ce, Eu, La, Lu, Nd, Sm, Tb, and Yb). The Enrichment Factor (*EF*) was applied to the results to ascertain possible anthropogenic sources for these elements, by using both North American Shale Composite and concentrations in bottom-sediment core samples as references. The results showed a constant distribution of these elements along the profile and *EF* ranging from 0.5 to 1.5, suggesting no anthropogenic contribution. Furthermore, the data of this study can be used to develop a sediment REE concentration data bank in water supply reservoirs and to establish background values for REEs.