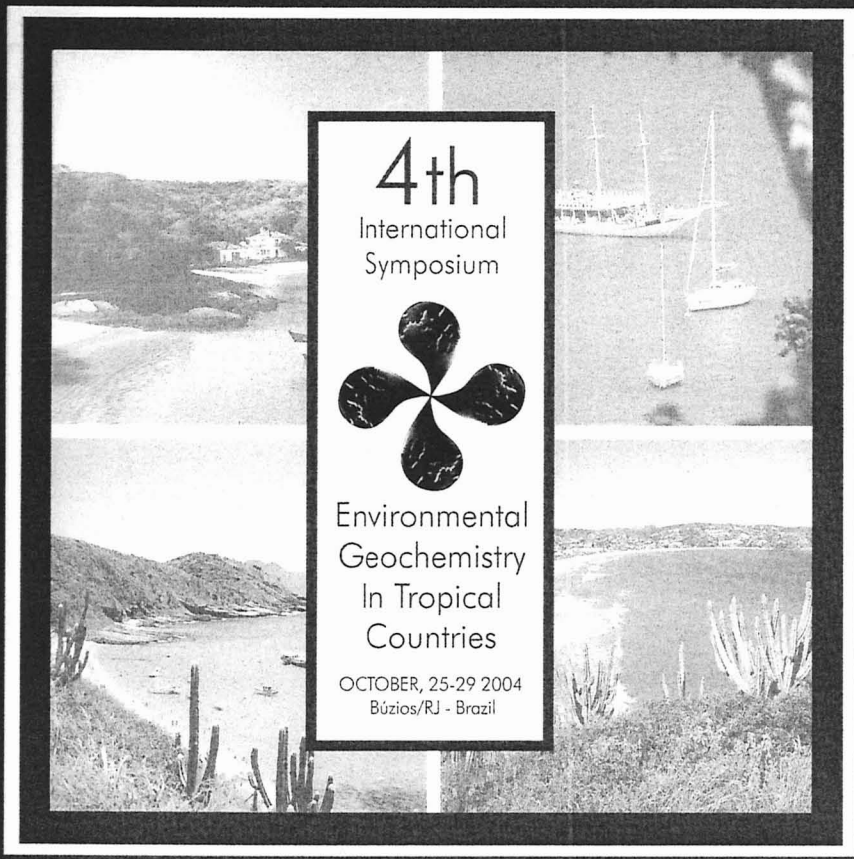


4th International Symposium on Environmental Geochemistry in Tropical Countries



Book of Abstracts

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Welcome Address

On the behalf of the Scientific and Organizing Committees, we would like to welcome you to Búzios, Brazil and 4th International Symposium Environmental Geochemistry in Tropical Countries fi 4th ISEGTC.

This Symposium is the fourth time of this Symposium following on previous Symposia in Niterói, Brazil (1993), Cartagena, Colombia (1996) and Nova Friburgo, Brazil (1999). The aim of this 4th International Symposium Environmental Geochemistry in Tropical Countries is to facilitate communication between senior and junior scientists working on different aspects of tropical environmental geochemistry. This is an excellent opportunity for environmental experts to discuss problems of mutual interest and global significance. We are certain that the 4th International Symposium Environmental Geochemistry in Tropical Countries will be the catalyst for fruitful and interesting discussions, and allow the participants to share know-how from different countries. Scientists from more than 20 countries will get together in Búzios, including: Argentina, ãustria, Belgium, Brazil, Botswana, Canadá, Chile, Costa Rica, Colombia, Croatia, Cuba, Denmark, France, Germany, India, Japan, Mozambique, New Zealand, Portugal, Spain, United Kingdom, USA, Venezuela and Zimbabwe.

All these contribution shown that a large interest exists for tropical environmental geochemistry, and also demonstrated the necessity of the perspectives for solving tropical environmental problems.

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AVAILABILITY OF LEAD IONS IN THE INDUSTRIAL STEEL WORK LANDFILL AT THE ESTUARINE SYSTEM OF SANTOS AND SÃO VICENTE, SÃO PAULO – BRAZIL

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Coastal regions, in general, tend to present intense human occupation, which means a huge pressure on the fragile ecosystems found there.

The estuarine systems of Santos and São Vicente, located in the Metropolitan Region of the lowlands in Santos-SP, represent one of the most important Brazilian examples of environmental degradation caused by pollution of industrial origin in the country, in Cubatão.

Among industrial activities that generate waste at the Estuary of Santos, one steel work industry is of major importance and of special interest to this work. Many metals are directly used as raw material or supplies and release a wide range of pollutant products to the environment, among which heavy metals are the most important.

The disposal of solid waste generated by different industrial steel work processes is in progress for more than two decades in the mangrove of Cubatão, and the Industrial Landfill was implemented only in the 1990s. For this study of lead ions availability associated with the steel work industry, we have chosen, as area of study, an Industrial Landfill located in the City of Cubatão, State of São Paulo, next to the SP 55 Road, which connects the cities of Cubatão and Guarujá.

The study performed a detailed survey of the pollutant source with collection of material from the piles of waste, superficial waters of Rio Piaçaguera along the Landfill, sediments from the margins, and

leachate. These materials were later destined to mineralogical, granulometrical and chemical characterization at the Laboratories of the Instituto de Geociências da Universidade de São Paulo.

The studies allowed the understanding of the behavior of lead ions, which in the superficial waters of Rio Piaçaguera are found in the form of lead sulfate (PbSO_4). The concentration of lead in the collected sample downstream Landfill is higher showing the contribution of the Landfill to the increase of lead concentrations in the waters and sediments of Rio Piaçaguera.

Samples from the piles of waste indicated a higher presence of lead at the top due to chemical reactions in the material exposed to weather conditions that cause such pH and Eh conditions for the mobilization of lead. The mobilized lead tends to accumulate in the center of the pile forming very stable composts.

Despite the low concentrations of lead detected in the samples from leachate, its release to Rio Piaçaguera contributes to the increase of lead concentrations at the estuarine ecosystem.

The conclusion is that in the area of studies the waste disposed in the Industrial Landfill present considerable lead concentrations that are being constantly released to the environment.

It is recommended, therefore, the systematic monitoring of the pollutant agents warning for the risk of bio-accumulation that causes increased rates of contamination at the higher levels of the trophic web like secondary and tertiary consumers living along the Estuary of Santos because they survive eating seafood contaminated by heavy metals.

METALS IN THE BOTTOM SEDIMENT FROM VIGÁRIO RESERVOIR, BRAZIL

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This study evaluated the historical metals deposition in the bottom sediment from the Vigário reservoir, that is a tropical reservoir located in an impacted area from Rio de Janeiro State. This reservoir was employed in 1945 with the transposition of the waters from the Paraíba do Sul River and was continuous problems with the margins erosion and macrophytes colonization. Vigário has a superficial area of 3.8km², a volume of 24.3 to 37.7 10⁶m³, a maximal profundity of 20m and a medium profundity of 9.2m. The Cd, Cr, Cu, Fe, Mn, Ni and Pb concentrations were evaluated in the layers of the cores of bottom sediment. The samples were collected in April of 2001 in the area near the dam from the reservoir. The cores were sliced in layers of three centimetres, that were dried at 60...C and sieved to separate the fine fraction (< 70µm) to subsequent analysis. Metals determination in these samples was performed using an Atomic Absorption Spectrometer (VARIAN AA-1475). The samples were digested in closed Teflon® vessels with a strong oxidant acid solution ($\text{HNO}_3\text{:HF}$ 5:1) at 100...C. Precision and accuracy of the analytical methods were determined using certified reference material. The metals concentrations in the layers of the bottom sediment showed that the deposition of metals in the sediment was not regular in the area near the dam. The highest concentrations of Cd and Mn were observed in a profundity of 9 to 12cm, and for Cr, Cu e Zn the highest concentrations were observed in the deep layers (21 to 27cm). The variation of Pb, Ni and Fe concentrations in the layers of bottom sediment were similar in different