
GEOCHEMISTRY MOBILITY OF Hg AFTER RESUSPENSION TESTS OF IGUAÇU RIVER SUPERFICIAL SEDIMENTS, GUANABARA BAY – BRAZIL

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Abstract

The Iguaçu River is one of the most important rivers of the drainage basin of Guanabara Bay. The objective of this work was to evaluate the geochemical mobility of Hg in sedimentary phases before and after resuspension. The sampling was carried out at dry season, collecting 12 samples of superficial sediments using Van Veen. The resuspension experiments were performed by mechanical agitation of closed polypropylene tubes containing 3.5g of wet sediment and 50mL of unfiltered water from the study area, during two time intervals: 1h and 24h. The water was filtered and the Hg determination was conducted using an ICP-MS. The sediment was submitted to two extractions sequentially: HCl 1M and USEPA 3051a, being the Hg determination on an ICP-OES. Mercury concentrations on the 3051A fraction were below the detection limit ($< 0.02\text{mg/Kg}$), suggesting low potential availability of Hg in these sediments. On the other hand, the strongly bounded phase showed before and after (1h and 24h) resuspension these respective concentrations: 0.15ppm, 0.19ppm and 0.18 ppm, a slight increase. Mercury concentrations in water from the experiment didn't showed variation. However, the polypropylene tubes used as an experimental blank (containing only water), showed significant differences on Hg concentrations on dissolved fraction: 0.008ppm (before), 0.026ppm (1h) and 0.014ppm (24h). Nevertheless the variation was bigger on blank tubes, suggesting the presence of mechanisms for oxygen consumption on tests tubes, probably due to organic matter degradation on sediment samples (before: 4.4% and 24h: 3,8% of total organic carbon). The water sample had pH 7. After resuspension, blank tubes showed no variation on pH (7.00 and 6.88) and in tests tubes water pH increased to 7.48 and 7.38 (1h and 24h, respectively). The physical-chemical changes were not sufficient to cause Hg mobility alterations on sediment, being mercury mainly on strongly bounded fraction, even after agitation.

Keywords: DREDGING, RESUSPENSION, COASTAL SEDIMENTS

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