
HG BIOAVAILABILITY AFTER RESUSPENSION TEST OF MERITI RIVER SUPERFICIAL SEDIMENTS, GUANABARA BAY, RJ – BRAZIL

Christiane Monte*¹, Ana Paula Rodrigues¹, Thatiane Neves¹, Ricardo Vasques¹, Patrícia Araújo², Zuleica Castilhos², Olaf Malm³, and Wilson Machado¹

¹Federal Fluminense University (UFF) – Brazil

²Centro de tecnologia mineral (CETEM) – Brazil

³Universidade Federal do Rio de Janeiro (UFRJ) – Brazil

Abstract

The Meriti River belongs to the drainage basin of Guanabara Bay (RJ), receiving industrial effluents (chlor-alkali company). The objective of this study was to evaluate the geochemical mobility of Hg before and after resuspension tests, simulating the effects of dredging activities. Superficial sediment samples using a Van Veen sampler. The samples were packed in plastic bags, kept under refrigeration until the arrival in laboratory. The resuspension experiments were performed by mechanical agitation (by 8 intervals) in erlenmeyer flasks containing 7.5 g of wet sediment and 100 mL of unfiltered water from the study area, in contact with air. After resuspension the material was centrifuged and two aliquots of the sediment were separated: one for performing a weakly bounded extraction, and another aliquot for total mercury determination (THg). Mercury determinations were conducted using a portable atomic absorption equipment. Mercury initial concentration on weakly bounded phase was 20.10ng/g, while total mercury concentration was 6,525ng/g, in other words, 0,3% of mercury is on weakly bounded phase, considered as potentially bioavailable. After resuspension, the concentrations found in weakly bounded phase were: 59.41ng/g (30min); 62.64ng/g (1h); 61.61ng/g (5h); 57.75ng/g (9h); 70.40ng/g (14h); 63.98ng/g (17h); 62.97ng/g (19h) and 76.43ng/g (24h). The average means of THg after resuspension were: 5,650ng/g – 5,940ng/g – 5,921.7ng/g – 6,521.7ng/g – 7,311.7ng/g – 7,238.3ng/g – 5,658.3ng/g – 7,053.3ng/g. The results showed an increase tendency on Hg concentration on bioavailable fraction after resuspension, which may be related to organic matter oxidation, transforming mercury on strongly bounded phases to a weakly bounded phase.

Keywords: DREDGING, MOBILITY, COASTAL SEDIMENTS

*Speaker