

## EVALUATION OF MERCURY LEVELS IN BOTTOM SEDIMENTS FROM SERRA DO NAVIO USING A RADIOCHEMICAL PROCEDURE

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Results from a survey on the mercury concentration in bottom sediments from a gold mining area along the Vila Nova river, in Serra do Navio, Amapa State, Brazil, are presented. The values were compared to background levels from Igarapé Pedra Preta basin.

Mercury is lost to rivers as metallic Hg<sup>0</sup> and it is preferentially accumulated in bottom sediments, presenting a very low mobility [1]. Therefore, sediments provide an excellent way to determine the mercury contamination in gold mining areas, reflecting the current status of the ecosystem.

Because of the chemical particulate fractionation in most areas, heavy metal concentrations increase with decreasing sedimentary grain sizes. Therefore, it is essential to normalize for the effects of grain size distributions before the effects of anthropogenic metallic inputs can be assessed [2]. In this work, the texture of the sediments were roughly classified by separation into their sand (particles between 0.063 and 2.0 mm) and mud (particles smaller than 63  $\mu\text{m}$ ) size components by wet sieving. The normalization of the data was carried out by direct determination of the total mercury concentration in the muddy fraction.

After grain size separation, samples were analyzed by a radiochemical procedure. They were irradiated for 16 hours in quartz vials, under a thermal neutron flux of  $10^{12} \text{ n cm}^{-2} \text{ s}^{-1}$ , in the IEA-R1 reactor from IPEN/CNEN-SP.

Determination of total mercury was carried out by using the <sup>203</sup>Hg and <sup>197</sup>Hg radioisotopes. The method consisted of leaching the irradiated sediment samples with aqua regia in a Parr bomb placed in a domestic microwave oven and subsequently extracting mercury selectively with bismuth diethyldithiocarbamate. Mercury levels were shown to be very high in the sediments collected in Vila Nova river (up to 2 mg kg<sup>-1</sup>) when compared to background values (0.3 mg kg<sup>-1</sup>). The precision and accuracy of the method were verified by means of analysis of reference materials Lake Sediment (BCR-CRM 280) and Buffalo River Sediment (SRM-NIST 2704).

- [1] Lacerda, L.D.; Salomons, W., Mercury in the Amazon—A Chemical Timebomb? Dutch Ministry of Housing, Planning and Environment. Haren, The Netherlands, 1991, 46 p.
- [2] UNEP/IOC/IAEA, Manual for the geochemical analyses of marine sediments and suspended particulate matter. Reference Methods for Marine Pollution Studies n° 63, UNEP 1995, 74 p.

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