EVALUATION OF MERCURY LEVELS IN SEDIMENT AND SOIL SAMPLES FROM VILA NOVA RIVER BASIN, IN AMAPÁ STATE, BRAZIL, USING NEUTRON ACTIVATION ANALYSIS

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In the present work, results from a survey on the mercury concentration in sediments and soils from a gold mining area along the Vila Nova river, in Amapá State, Brazil, are presented. These values were compared with those from samples collected in the Igarapé Pedra Preta basin, an area unaffected by mining activities. The sampling took place between 1994 and 1996.

Total mercury contents were determined in the muddy (silt+clay) fraction of the sediments and in the < 2mm fraction of the soils using radiochemical neutron activation analysis. Samples and standards were irradiated for 16 hours in quartz vials, under a 10^{12} n $cm^{-2}s^{-1}$ thermal neutron flux, in the IEA-R1 reactor from IPEN/CNEN-SP. Determination of total Hg was carried out by using the ^{203}Hg and ^{197}Hg radioisotopes. The detection limit of the method was 54 µg kg^{-1} for soils and 14 µg kg^{-1} for sediments when 200 mg of sample were analysed.

Mercury levels showed to be very high in the soils and sediments collected in the Vila Nova river (up to 2 mg kg^{-1}) when compared to background values (0.3 mg kg^{-1}).

In order to obtain a normalizing factor, aluminium was also determined in the sediment samples by X ray fluorescence method. The enrichment factor in sediments of the Vila Nova river basin, reaching values up to 8, indicates a relatively high degree of pollution as compared with the values of about 1 for the samples of the Igarapé Pedra Preta basin. The enrichment factor was chosen because it is a convenient device for discussing geochemical trends and making comparisons between two different areas.