

**Transport and behaviour of total mercury in the Amazon River
at the confluence of black and white waters**

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Transport and transformation of mercury and the role of organic matter in these processes have been studied in the Amazon river at its confluence of the Negro ('black water'), Solimões and Madeira ('white waters') rivers. With the Tapajós R., the Negro R. presents the highest total Hg content (11,6 to 18,2 ng l⁻¹). This high Hg concentrations measured in the Negro R. are due to the extreme particulate Hg content which reach values (2074 ng g⁻¹ at the surface) 10 to 20 times higher than these measured in the other Amazon tributaries. Beyond flood hydrological period, the mercury compartment is mainly conditioned by the colloidal and particulate carbon. The total organic carbon analysed in the Negro R. waters is constituted mainly with particulate carbon (54,8%) whereas the dissolved organic carbon is composed mainly with humic compounds (50%), carriers for most of the metal ions transported in the rivers. The high Hg concentrations observed in the Negro waters can be explained by the run-off processes in the drainage basin associated with the Hg speciation processes in the forest soils. The compartment and the accumulation of Hg are controlled by complexing and mobile humic compounds and by their adsorption on the Fe and Al oxy-hydroxydes.

At the confluence of the Negro R. black waters and the Solimões R. white waters, we can observe an abrupt decrease of the Hg content. The Hg fluxes carried by the Negro and Solimões rivers, in dry hydrological season, reach respectively 39 and 55 kg Hg d⁻¹ ; 60 km downstream their confluence, this flux decreases to 73 kg Hg d⁻¹, which represents a net loss of 5 kg dissolved Hg d⁻¹ and 15 kg particulate Hg d⁻¹. This losses must be correlated with the compartment of the total suspended matter and with the particulate and colloidal organic carbon. In black waters, mercury is mainly adsorbed on organic particles, linked to Fe and Al oxy-hydroxydes of the colloidal fraction, and can flocculate and deposit in the confluence zone with white waters.

On the other hand, downstream the confluence of the Amazon with the Madeira R., mercury is conservative. Its total concentration reaches 9,8 ng l⁻¹ downstream which differs from 2,8% with the theoretical value, which is in the same range of the analytical precision.

MANAUS 99

International Symposium Hydrological and Geochemical Processes in Large Scale River Basins

November 15-19, 1999, Manaus, Brazil

PROGRAM and ABSTRACTS

Organized by **HiBAm**
Hydrology and Geochemistry of the Amazon Basin



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