

MERCURY IN SOILS FROM THE TAPAJÓS BASIN, BRAZILIAN AMAZON

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This presentation will explore the relationships between Fe and Hg contents in a typical lateritic soil profile in the Tapajós valley. This region is the largest artisanal gold mining area in Brazil utilizing Hg amalgamation. The amalgamated gold is burned emitting Hg in the atmosphere, which is returned to the terrestrial environment by precipitation on the soil surface. Sampling was carried out in a soil profile that consists from top to bottom of four well differentiated horizons: (H1) a 80 cm thick homogeneous loose clay horizon, (H2) a 20 to 40 cm thick ferruginous duricrust, (H3) a 50 cm thick saprolite horizon, and (H4) a several meters thick horizon of weathered volcanic acid rock. Contents of Fe and associated elements (V, Cr, As, Sb, Sc) increase regularly from H4 to H2, attaining the highest values in the ferruginous duricrust where the most abundant mineral is goethite. H1 is strongly depleted in these elements. Mercury presents a similar behaviour (39 ppb in H4, 153 ppb in H3, 286 ppb in H2), excepting in H1 where its decrease is less conspicuous (174 ppb). This pattern of Hg distribution in such a soil profile can be interpreted as a result of the superposition of two processes: (1) lateritic pedogenesis leading to the accumulation of Fe, associated elements and Hg in a duricrust horizon, and depletion of the same elements in the upper clayey layer; (2) deposition of atmospheric mercury on the surface horizon of soils and its redistribution in the upper levels of the soil profile.