

MIGRATION PROCESSES OF SOLUBLE AND COLLOIDAL GOLD LATERITIC DEPOSITS

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Hydrochemical monitoring of the Yaou deposit catchment in French Guiana was carried out so as to model the processes of gold remobilization and dispersion in Amazonia. The measurement system of soil pore water, groundwater and surface waters was installed during a complete hydrological cycle. Gold analysis was carried out on solutions filtered at 0.1 and 0.45 μm to determine the amounts of dissolved and colloidal gold. The gold concentrations in all the solutions were found to be mainly due to the presence of colloids. The gold concentration in the soil pore water above the deposit is between 10 and 20 ppt in the humiferous horizon at 0.5 m depth and falls to less than 10 ppt in the B horizon at 1 m depth. The groundwater draining the deposit contains about 15 ppt colloidal gold, with a maximum of 60 ppt at the oxidation front. The average gold concentration at the basin outlet was about 50 ppt, with peaks occurring at the beginning of the wet season. This means that the soil pore waters is relatively concentrated after the dry season and then leached by surficial runoff. The flux of gold transported to the basin outlet was estimated at 0.24 g/ha/y. Calculation of the relative contribution of the shallow runoff and of the saprolite groundwater reservoirs showed that gold liberated at the oxidation front of the mineralization provided 30 % of the exported Au flux and that leached from the soils and transported by shallow runoff contributed to 70%.