

SULPHUR ISOTOPE DATA FOR SULPHIDES FROM THE SERRA DO ITABERABA GROUP, SÃO PAULO - BRAZIL

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Tapera Grande and Quartzito (Serra do Itaberaba Group, São Paulo - Brazil) were explored in the XVIII century for gold. Ore and scanning electron microscopy studies helped define four stages of sulphidation, also constrained by laser S stable isotope data. Stage I is best characterised by gold-bearing graphite schists in Tapera Grande, represented by pre-S1 pyrrhotite (-5.47 ‰ d34S -8.7 per mil), with minor pyrite and chalcopyrite. Stage II sulphides fill intergranular spaces and microfractures, probably coeval with S3/S4 structures. d34S values obtained for pyrrhotite/pyrite crystals from gold-bearing quartz veins crosscutting volcanoclastic rocks from both Tapera Grande and Quartzito fall within a +4.5 to +7.36 per mil range. Stage III is best represented in Quartzito. When not isolated, chalcopyrite fills cavities or grows along faces and corners of Stage II pyrite crystals. These chalcopyrite crystals yield d34S values between 3.6 and 2.6 per mil. Free gold was found associated with their alteration to chalcocite and covellite. In Stage IV, pyrite predominates (2.4 per mil d34S 2.9 per mil). Lower-temperature, submicroscopic galena (d34S = 1 per mil), Ag-bearing Bi telurides and REE minerals occur isolated or filling cavities and fractures of the sulphides from the previous stages. Molibdenite (d34S = 3 per mil) and scheelite may be associated either with stages III or IV. Negative d34S values favour a syn-sedimentary origin for Stage I sulphides (and associated gold?) whereas positive and decreasing d34S values for Stages II to IV mark epigenetic sulphide deposition associated with shearing.