

GEOCHRONOLOGY AND ISOTOPE GEOCHEMISTRY (SR, PB) OF IGNEOUS ROCKS OF THE PORTOVELO-ZARUMA GOLD MINING AREA, EL ORO, ECUADOR

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The Portovelo-Zaruma region, El Oro province, located in the western slope of the Occidental Andean Cordillera in Ecuador, is characterized by a metamorphic basement intruded by El Prado calc-alkaline granitoid, and covered by intermediate volcanic rocks (Celica Formation) with associated Au-Cu mineralizations. The 211 ± 26 Ma (Rb-Sr isochron) age of the El Prado granitoid is similar to those of the Marcabeli (227.5 ± 0.8 Ma, U-Pb) and Moromoro (219 ± 22 Ma, Sm-Nd) granitoids, characterizing a magmatism contemporaneous to the event that structured the El Oro Metamorphic Belt. The Sr initial ratio and the Pb isotope composition suggest an upper mantle source with crustal contamination for the El Prado granitoid. The 48 ± 12 Ma age (Rb-Sr isochron) of the Celica Formation is interpreted as that of its extrusion. It is geochemically similar to the calc-alkaline series of island arcs or continental margins. Sr initial ratio and Pb isotope composition indicate that it could be a product of anatexis of subducted oceanic crust plus sediments. The heating emanated from the volcanism affected the El Prado Granitoid as indicated by its Rb-Sr mineral age (50 ± 1 Ma). The Sr isotopic ratios of the calcites from the gold-bearing veins cutting the volcanic rocks are similar to those of their host rocks, suggesting a common source for both materials. The Pb of the galenas of the veins is less radiogenic than that of the volcanic rocks. This may be due to the influence of hydrothermal solutions that percolated the granitoids.