



GEOCHRONOLOGY OF THE RÍO BLANCO PORPHYRY Cu(-Mo) DEPOSIT, PRINCIPAL CORDILLERA, CENTRAL CHILE (33°08'S).

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The Río Blanco porphyry copper-molybdenum deposit has been subject of a systematic high-quality geochronological research. Multi- and single zircon grain IDTIMS and single zircon grain SHRIMP U/Pb analytical procedures have been applied in order to obtain a precise time frame on the extrusive and intrusive activity of mineralization hosting rocks. Two andesitic lavas of 16.77±0.25 and 17.20±0.05 Ma could be related to the Farellones Formation overlying the San Francisco Batholithic unit in the Río Blanco sector. Three granitoids of the San Francisco Batholith reveal two temporally separated pulses, around 12 Ma and 8.2-8.4 Ma. The historically as post-mineralization considered dacitic-to-rhyodacitic Late Porphyry suite yielded ages between 5.23-6.32 Ma by IDTIMS and slightly younger between 5.08-6.16 Ma by SHRIMP.

⁴⁰Ar/³⁹Ar data on biotite single grains and veins, related to potassic alteration, cluster around 4.6 Ma with ages ranging from 4.57 to 5.12 Ma and 4.59 to 5.32 Ma, respectively. Phyllic alteration in the deposit has been dated by ⁴⁰Ar/³⁹Ar spot fusion analyses on selected quartz-sericite and quartz-sericite-chalcopyrite veins yielding ages of 4.37±0.06 and 4.40±0.15 Ma, respectively. The Dacite diatreme of the La Copa Volcanic Complex belonging to the late-to-post mineral intrusives in the Río Blanco mine area gave a SHRIMP U/Pb single zircon age of 4.92±0.09 Ma, older than the phyllic alteration event dated by the ⁴⁰Ar/³⁹Ar method.

These data combined with recently published Re-Os ages let suggest that the Late Porphyry suite represent at least in part syn-mineralization rock-units and, on a greater scale, both supergiant porphyry Cu(-Mo) deposits, Río Blanco-Los Bronces and El Teniente, are coeval within their errors.