

Metamorphic zircons in ophiolitic chromitites from Central Chile

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The Western Series of the Late Paleozoic basement of south Central Chile contains a series of mafic and ultramafic bodies associated with a heterogeneous array of metasedimentary rocks metamorphosed under high pressure and low temperature conditions. The relation between host rock and ultramafic bodies is still poorly understood, in particular, there is no geochronological constraints on the ultramafic rocks. In order to fill this gap of knowledge, we present the first U-Pb SHRIMP zircon dating and in-situ Re-Os model ages on Os-Ir-Ru-rich PGMs recovered from chromite ores hosted in the ultramafic rocks.

Cathodoluminescence images (CL) show that most zircon grains have complex zoning and clear signs of recrystallization at their borders. Most of the analyzed zircons ($n = 13$) yielded Paleozoic ages, some of them clustering at ~ 286 Ma (e.g., 284 ± 4 and 281 ± 7 Ma) with U/Th ratios over 30. Rhenium-depletion model ages (T_{RD}) on the PGMs, calculated relative to Enstatite Chondritic Reservoir [1], cluster at $\sim 270 \pm 15$ Ma.

Considering the uncertainty in T_{RD} model age calculations, both zircons and PGMs yield identical peak ages. Textures of the zircons coupled with their high U/Th values indicate a metamorphic origin. This is consistent with the observation that many of the analysed PGM were identified in metamorphogenetic rims of chromite [2]. We suggest that zircons and PGMs crystallized during a metasomatic event related to the emplacement of the La Cabaña Massif in the metasedimentary host during their exhumation.

[1] Walker, R.J. et al. (2002). *Geochimica et Cosmochimica Acta*, v. 66, p. 4187–4201.

[2] González-Jiménez et al. (2016). *Ore Geology Reviews*. In Press