Boron isotopes and chemistry from intra-granitic pegmatites in the Las Chacras batholith, Central Argentina

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The southernmost part of the Pampean Pegmatite Province in central Argentina hosts a complex magmatic system of hybrid monzonitic to granitic intrusions with intra-granitic pegmatites. The inter-relations of these rocks raise questions about the tectono-magmatic framework, the conditions of crustal melting and the influences of mantle derived magmas. The middle Devonian I- to A-type Las Chacras Batholith comprises nested intrusions of granites with common mafic enclaves and stocks of monzonite, locally with lamprophyre affinity. Radiogenic Nd and Sr isotope data from the granites, enclaves and monzonite stocks suggest a crustal source with significant influence of subcontinental lithospheric mantle [1]. Intra-granitic pegmatites with NYF-type signatures represent the peak of chemical evolution in the batholith. In order to improve our understanding of the pegmatites and their relationships to the evolution of the magmatic system, we have studied the compositional trends of pegmatitic minerals, with a focus on K-feldspar, muscovite and tourmaline. Major and trace-element compositions coupled with tourmaline B-isotope data are used to define a distinct fractionation trend of pegmatite-forming melts within different granitic units. Variations of K/Rb vs. Rb/Sr, Cs and Ba in K-feldspar; and K/Rb vs. Cs, Ba and Li in mica reflect stages of differentiation from the least-evolved granitic source to barren and more-evolved beryl type pegmatites. The B-isotope composition of tourmaline ($\delta^{11}B$) from 10 pegmatites is very uniform, with a total range of -14.1 ‰ to -10.9 ‰ (n=100). These values suggest a crustal source of boron, similar crystallization temperatures throughout the pegmatite field and no fluid exsolution prior to tourmaline crystallization.

[1] López de Luchi, M. et al. (2017) *Lithos* 288-289, 191-213.