TIMS U-Pb dating of bastnäsite, calzirtite and tantalite as a powerful tool for timing of rare-metal granites and carbonatites (Eastern Siberia)

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Complex Ti, Nb-Ta and Zr oxides, primary HFSE hosts like baddeleyite, zirconolite, perovskite, pyrochlore are well known minerals appropriated for U-Pb dating of carbonatites, phoscorites as well as granitic pegmatites of the rare-element class. We propose to extend this list with calzirtite, tazheranite and bastnäsite.

Bastnäsite ((LREE)(CO_3)F) is a typomorphic mineral of siderite carbonatites from the Karasug (REE, Ba, Sr, F, Fe) deposit (Tuva Republic) Concordant U-Pb age at 118±1 Ma was obtained for bastnäsite which is in good agreement with Sm–Nd and Rb–Sr ages [1]. The minerals of this group are widespread and, in particular, represent the major economic LREE minerals in the deposits related to nontraditional carbonatite complexes, as well as occur in highly alkaline pegmatites, alkaline granites and scarns.

Tazheranite ($CaTiZr_2O_8$) and calzirtite ($Ca_2Zr_5Ti_2O_{16}$) are the characteristic accessory minerals in alkalic and ultramafic complexes associated with carbonatites. A Tazheran (SW Lake Baykal) calzirtite and tazheranite yielded a Concordia U-Pb ages at 466±2 Ma and 464±2 Ma respectively which are consistent with zircon U-Pb age at 471±5 Ma [2] as well as perovskite U-Pb age at 462.8±2.5 Ma [3].

For the first time U-Pb isotopic analyses were carried out on tantalites from three suites of pegmatites in East Sayan large-scale rare-metal province. The ages of 1838±3 Ma 1824±7 Ma and 1738±5 Ma have been obtained. These data demonstrate that mineralization is just for 30-100 Ma younger than country post-collisional Sayan granites (1858±20 Ma) [4].

Our study advertises bastnäsite, calzirtite, tazheranite as well as tantalite as promising tool for U-Pb timing of mineralization related to plumasitic type rare-metal granites and some of carbonatites.

[1] Salnikova *et al*. (2010) *Doklady Earth Sciences* **430**, 134–136. [2] Sklyarov *et al*. (2009) *Russian Geology & Geophysicse* **50**, 1091–1106. [3] Qiu-Li Li *et al*. (2010) *Chem Geol* **269**, 396–405. [4] Levitsky *et al*. (2002) *Russian Geology & Geophysics* **8**, 717–731.

A new debate on the origin of granitoid rocks from Dehnow area (NE Iran), based on isotopic data

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Introduction

Magma origin of Dehnow tonalite was always under debate. [1] revealed valuable isotopic data for these rocks and suggested that they are S-type. [2] introduced them I-type based on whole rock geochemistry (e.g. Zr & Zn vs. SiO_2 plots, etc) and mineralogy. In this work, we try to illuminate the fact by putting isotopic values from [1] on figure below.

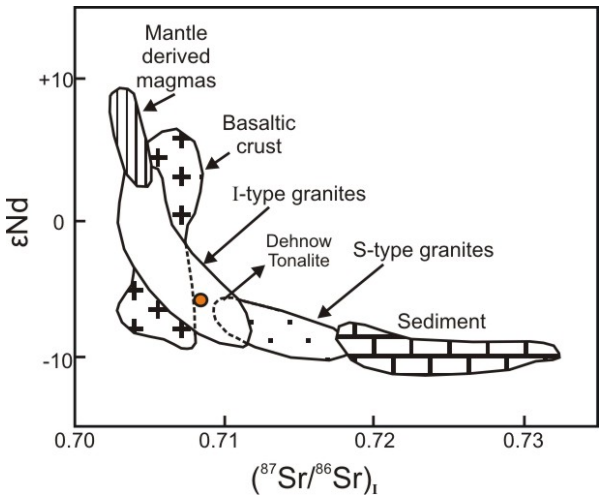

Figure 1: εNd vs. Sr isotope ratio [3, 4].

Discussion

In fact, according to figure 1, isotopic data of [1] ($^{87}Sr/^{86}Sr$=0.7079-0.7085 and εNd=-6.63 to -5.90) completely confirm the results by [2] and simply underline I-type granitoids nature of these rocks.

[1] Karimpour *et al*. (2010) *J Asian Earth Sci* **37**, 384–393. [2] Samadi *et al*. (2010) *1st IAGC* 1265. [3] Dickin (2005) *Radio Iso Geol* 492. [4] Keay *et al*. (1997) *Geol* **25**, 307–310.