# Zircon from Rare-metal Li-F Granites: Magma Chamber Processes and Magma Source

A.M. SAGITOVA [1]*, E.V. BADANINA [1], L.F. SYRITSO [1], V.S. ABUSHKEVICH [2] AND E.V. VOLKOVA [1]

[1]Saint-Petersburg State University, St.Petersburg, 199034, Russia (*correspondence: adel-sagitova@yandex.ru)

[2] Institute of Precambrian geology and geochronology RAS, St. Petersburg, 199034, Russia

Some features of zircon chemical evolution from the differentiated granite series from biotite to lepidolite-amazonite-albite granite and during zonal crystal growing have revealed based on studying of internal texture and trace element composition of zircon (results of secondary ion-microprobe analyses, SIMS) from differentiated massifs of Li-F granites from Eastern Transbaikalia, Russia.

The studied zircon is characterized by the typical zoning (CL and BSE imaging): inherited cores (I), zone with oscillatory zoning (II), regular sponge rim (III) and irregular zone with convolute zoning (IV). The main chemical evolution trend during the complication of internal texture is enrichment in trace element (U from 177 to 58248 ppm, Hf from 1.09 to 20.41 wt% $HfO_2$) and REE, that`s sum is varying from 416 to 16498 ppm along with significant transformation of REE patterns.

Revealed features reflect some magma chamber processes. Old cores overgrowing (from zone I to II) corresponds to crystal fractionation process – increasing Th+U relatively Hf and significant decreasing of LREE marks destroying fluid effect [2]. Reduction of the positive Ce anomaly and decreasing of the $Sm_N/La_N$ ratio reflect hydrothermal influence on the zircon (zone III) [3]. Zircon with maximal REE content (up to 16498 ppm) and strong HREE enrichment (zone IV) corresponds to mineralization stage that confirms the idea of importance of hydrothermal process for tantalum mineralization.

The chemical composition identity of zircon cores from ore-bearing Orlovka massif and zircon from host highly specialized trachyrhyodacites [1], the same age interval – 235.4±2.4 Ma and 254.7±5.1 Ma (SHRIMP-II, VSEGEI) let presume the same magma source. Age of II zircon zone is 140.6±2.9 Ma, that corresponds to age of parental intrusion formation.

This study was performed at Geomodel, Nanotechnology, Microscopy Resource Centers, Research park of SPbSU.

[1] Babanina et al. (2008) *Petrology* **18**, 131-157 [2] Cao et al. (2011) *Journal of rare earths* **29**, 277-285 [3] Pelleter et al. (2007) *Chemical geology* **245**, 135-161