



Baddeleyite from Paleoproterozoic Cu-Ni and PGE deposits (N-E part of the Fennoscandian Shield, Arctic region): new U-Pb, Sm-Nd and LA-ICP-MS data.

Tamara Bayanova (1), Subbotin Viktor (1), Serov Pavel (1), Kunakkuzin Evgeniy (1), Drogobuzhskaya Svetlana (2), Steshenko Ekaterina (1), and Neradovsky Yurii (1)

(1) Geological Institute of KSC RAS, Apatity, Russian Federation (bayanova@geoksc.apatity.ru), (2) I.V. Tananaev Institute of Chemistry and Technology of Rare Elements and Mineral Raw Materials of KSC RAS, Apatity, Russian Federation

Baddeleyite is most important mineral compared with zircon for precise U-Pb dating mafic-ultramafic rocks (Heaman, LeCheminant, 1993, Schaltegger, Davies, 2017). Single grains of baddeleyite were separated from gabbro-norites, anorthosites and dykes complexes of the layered intrusions from Monchegorsk ore region with Cu-Ni and Pt-Pd reefs, low sulfides Fedorovo-Pansky massif with Pt-Pd reefs (Mitrofanov et al., 2013, Chashchin et al., 2016) and Cr-Ti-V Imandra lopolith of the Central Kola megablock. All these giant deposits and ore regions are formed or have at the basement continental crust with TTG and grey gneisses of Eoarchean and Paleoproterozoic U-Pb zircon ages from 3.7 to 3.1 Ga (Bayanova et al., 2016). Precise U-Pb ages on single zircon-baddeleyite grains from the main gabbro-norite phases of the Cu-Ni and Pt-Pd reefs of the 3 regions yielded 2.5 Ga. The second impulse with 2.45 Ga of magmatic activity with Pt-Pd reefs are connected with anorthosites from the layered intrusions of the Fedorovo-Pansky and Monchegorsk ore regions due to U-Pb data on baddeleyite-zircon geochronometer. Isotope Sm-Nd dating sulfides minerals from the gabbro-norite and anorthosite the same massifs have a coeval ages with U-Pb data. Baddeleyite from gabbro-norite dykes complexes of the Imandra lopolith with U-Pb age 2.4 Ga data are finale of the more than 100 Ma plume basite-ultrabasite primary fertile (EM-1, OIB, E-MORB, N-MORB) reservoirs of superlarge multimetal deposits with unique reefs (Bayanova et al., 2009, 2014, Nerovich et al., 2014, Yang et al., 2016, Huhma et al., 2018). Baddeleyite from Cu-Ni Pechenga largest deposits gave U-Pb age 1980 ± 2 Ma. In additional similar Sm-Nd isochron age on sulfides and rock-forming minerals have been measured with 1965 ± 87 Ma for the same rocks. Youngest U-Pb age with 1881 ± 9 Ma has been obtained on baddeleyite from clinopyroxenite of Kolvitsa Ti-Mgt deposit from Kandalaksha-Kolvitsa zone. The features of the baddeleyite crystals are characterized by absence of zircon rims and U-Pb system are a very preserve and coordinate points lie on the concordia line.

Features of baddeleyite crystals from Pt-Pd and Cu-Ni reefs on continental crust are characterized by less preserve U-Pb systems and points of coordinate have a small discordances. New LA-ICP-MS researches REE and closure temperatures in U-Pb system using Ti and Zr concentration in grains are suggested about low (850-900°C) temperatures of crystallization compared with baddeleyite from Cu-Ni reefs which origin in oceanic crust. Studies of PGE concentrations by laser ablation techniques on sulfides minerals implied more Pd in pyrite and Pt in pyrrhotite from the Cu-Ni and Pt-Pd reefs in oceanic and continental crust (Mitrofanov et al., 2013).

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