[EE] Evening Poster | S (Solid Earth Sciences) | S-MP Mineralogy & Petrology

[S-MP34]Oceanic and Continental Subduction Processes

convener:REHMAN Ur Hafiz(Department of Earth and Environmental Sciences, Graduate School of Science and Engineering, Kagoshima University), Tatsuki Tsujimori(Tohoku University), Chin Ho Tsai
Sun. May 20, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
This international session aims at bringing earth scientists from Japan and overseas to present their research related to the processes of oceanic and continent subduction, continent-continent collisions, metamorphism of crustal rocks, formation of the oceanic/continental arcs, and accretion/ tectonic erosion of material along subduction boundaries.

Topics such as role of the fore- and back-arcs in the subduction zones, process of accretion of volcaniclastic and terrigenous sediments along the subduction/collision boundaries, deformation and metamorphism of subducted crust, recycling of material via tectonic erosion and exhumation will be the main focus of the session. Exchange of ideas among geoscientists applying different approaches on problems related to the theme of the session are most welcome.

[SMP34-P03]Magma genesis and temperature of crystallization deduced from igneous zircons

★ Invited Papers

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Keywords:Zircon, Magma, Rodinia, Crystal, Apatite

Magmatic zircons of Precambrian age were investigated for magma genesis and crystallization temperatures. Use of thermobarometry is common in metamorphic petrology in which the existing mineral pairs or multi-phases are used to determine the pressure-temperature conditions under which the rocks have been metamorphosed or cooled. In igneous rocks, the scenario is complex, especially if there are not many phases present. Particularly, if the rocks are weathered or lost it is hard to deduce the magmatic records. Pupin (1980) introduced zircon crystal shapes to relate them with the magma genesis and crystallization temperatures. Pupin’s method was applied for zircons picked from granitic plutons of Mesozoic and younger granites. In this study, we applied this method to Late Proterozoic zircons from the Nagar Parker Igneous Complex in southeast Pakistan. The complex is the western extension of the Malani Igneous Suite of the Indian Shield. Based on zircon crystal shape and morphology, we could determine temperature of crystallization which falls between 600 to 850 °C. When compared, these values show consistent temperature estimates with the Ti-in-Zircon thermometry (same zircon grains analyzed for trace elements using LA-ICP-MS). A few zircon grains show a temperature difference of +/- 50 ~ 100 °C when the results were compared from both the methods. Based on Pupin’s (1980) method, the investigated zircons show granite and monzogranite fields, consistent with the field data as those zircons were collected from the granites of the NPIC. In summary, zircon crystal shape is a useful tool, and even if the protolith records are lost, information of the magma genesis, crystallization temperatures and parent rock can be extracted.

Reference

Pupin, J. P. 1980. Zircon and granite petrology. Contributions to Mineralogy and Petrology 73, 207-220.