[EE] Evening Poster | S (Solid Earth Sciences) | S-IT Science of the Earth's Interior & Tectonophysics

[S-IT23]New perspectives on the geodynamics of East Asia

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Sun. May 20, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

The Pacific, Indo-Australia and Eurasian plates converge around the Philippine Sea plates in south and East Asia, resulting in one of the most tectonically active regions on earth. The area is also geologically and tectonically complex with numerous active tectonic environments, ranging from subduction to collision, and a long history of plate boundary interactions. The last decade has yielded a wide range of new observations, including detailed geologic data and high resolution crustal to mantle imaging. Here we seek oral and poster presentations that bear on the geologic history and geophysical character of modern and ancient plates in East Asia and their interactions since the Mesozoic. We also invite geodynamic models that integrate these diverse datasets into a more holistic view of this dynamic environment.

[SIT23-P05]Discovery of plagiogranitic rocks and their effusive equivalents in the Nakanogawa Group, southern Hidaka Belt, Hokkaido, Japan

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Keywords:Plagiogranite, Hiroo Complex, Nakanogawa Group, Hidaka Belt, Izanagi Plate

A small granitic body was recently discovered in the Hiroo Complex, Nakanogawa Group, Hidaka Belt, southern Hokkaido, Japan. The granitic rocks occur as a <100-m-wide small body in the Rakko river ca. 4.5 km northwest of its river mouth. The granitic rock intrudes into surrounding greenstones, whose color has changed to reddish brown in a ca.-30-cm-wide area at the contact. The granitic rocks were subject to strong brittle deformation and have been variously altered together with the surrounding greenstones. Although the direct relationship between the granitic rocks and sedimentary rocks in the Nakanogawa Group is unclear, the greenstones are accompanied by red cherts and limestones occurring as blocks in the alternating sandstone and mudstone layers. Thus, the granitic rocks and greenstones are presumably a large block in the Nakanogawa Group.

The granitic rock is tonalite and composed mainly of quartz, plagioclase, and amphiboles. A small number of opaque minerals is also present. The whole-rock major elemental chemistry is rich in silica (SiO_2 = 71.0–73.7 wt%), and the alumina saturation index (Al_2O_3/CaO + Na_2O + K_2O in molar ratio) is 0.9–1.1. The tonalite is characterized by an extremely low content of K_2O (0.2–0.3 wt%). This geochemical feature, together with lithological features, make the tonalite quite similar to plagiogranites found in ophiolites. In fact, so-called plagiogranites in ophiolites and ocean floor show a wide range of composition (e.g., Koepke et al., 2007); however, plagiogranites from many representative ophiolites commonly show exceptionally low content of K_2O in accordance with the traditional definition of plagiogranite (e.g., Coleman and Donato, 1979). The tonalities in this study are characterized by relatively flat chondrite-normalized rare-earth-element patterns ($La/Yn_{[N]A.V.}$ = 2.3; $_{A.V.}$ denotes averaged value). This feature is also concordant with plagiogranites in the Elder Creek ophiolite, California ($La/Yn_{[N]\ A.V.}$ = 2.2; Shervais, 2008). On the other hand, greenstones intruded by tonalities show 71–72 wt% of SiO_2, and 0.1–0.4 wt% of K_2O. These compositions closely resemble

those of tonalities, and suggest that both effusive and plutonic phases formed by contemporaneously common igneous activity. Overall geochemical features of the tonalite-dacite are distinct from ~46-Ma granites in the Hidaka Magmatic Zone in the Hidaka Belt (e.g., $La/Yn_{[N]\ A.V.} = 4.6$), and from presumable lithologies from the Tokoro, and Nemuro belts; i.e. Daimaruyama Greenstones in the Nakanogawa Group (Hidaka Belt; e.g., $La/Yn_{[N]\ A.V.} = 6.4$), greenstones in the Toyokoro area (Tokoro Belt; e.g., $La/Yn_{[N]\ A.V.} = 2.7$), and granitic gravels from the Nemuro Belt (e.g., $La/Yn_{[N]\ A.V.} = 5.0$). Thus, the studied samples exhibit a unique composition compared to that of all the felsic igneous rocks thus far reported from the Hidaka, Tokoro, and Nemuro belts.

The major- and trace-element characteristics are consistent with partial melting of amphibolite-facies oceanic crust at relatively low pressures (5–10 kbar) outside the garnet stability field. Melting of oceanic crust at these pressures can only occur under the influence of an active spreading center. Recent reconstruction of global plate motion suggests that the Izanagi plate had subducted beneath the Eurasia plate by 60 Ma, and the Izanagi–Pacific ridge was subducted from approximately 60–50 Ma (Müller et al., 2016). In addition, intra-oceanic subduction on the Izanagi Plate has recently been proposed (Yamasaki and Nanayama, 2018). Thus, subduction of the Izanagi–Pacific ridge in either an intra-oceanic or Eurasian margin subduction zone, or melting of oceanic crust at Izanagi–Pacific ridge, can be assumed as the origin of the plagiogranite-dacite, at present. Determination of formation age remains an important issue to constrain the locality of its formation and requires further study.