

Geochemistry and geochronology of igneous and metamorphic rocks around the Jang Bogo Station, Northern Victoria Land, Antarctica

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Jang Bogo Station, one of Korean Antarctic year-round stations, is located on the coast of Terra Nova Bay in Northern Victoria Land. Metamorphic and igneous rocks around the Jang Bogo Station mainly consist of early Paleozoic greenschist to amphibolite facies schists and gneisses of the Wilson Metamorphic Complex, and granitoids (granite and diorite) of Granite Harbour Igneous Complex. Granitoids show wide compositional range from gabbro to granite. Most of granitoids belong to metaluminous to peraluminous I-type granite except for leucocratic granite predating the intrusion of granitoids, belonging to peraluminous S-type granite. Granitoids commonly show negative anomaly for Ba, Nb, P and Ti and constant HREE pattern, whereas leucocratic granite shows discernible additional negative anomaly for Sr and various HREE pattern in spider diagram. Granite shows steep negative slope for LREE and flat HREE with Eu negative anomaly. Leucocratic granite shows similar variation pattern with granite except for predominant Eu negative anomaly and variable HREE pattern. Most of granitoids and leucocratic granite are plotted in VAG+syn-COLG, suggesting arc environment. The youngest detrital zircon age of meta-sedimentary schists and gneisses is dated at < ca. 700 Ma and < ca. 590 Ma, respectively, with metamorphic age at ca. 510 Ma on the overgrowth rim. Emplacement age of leucocratic granite intruding the schists and gneisses along the foliation is dated at ca. 482-480 Ma with slightly old age of ca. 524 Ma at the core. Emplacement age of granites is dated ca. 480-460 Ma. Peak metamorphic event occurs before the intrusion of granites at ca. 480 Ma, and major magmatic event at ca. 480-460 Ma.