

Meta-BIF collected from the Mt. Riiser-Larsen, Amundsen Bay, East Antarctica

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The Japanese Antarctic Research Expedition (JARE) carried out earth scientific research at Amundsen Bay, Enderby Land, East Antarctica, from 1997 to 2002 in order to understand the Structure and Evolution of Antarctic Lithosphere (called SEAL Project). This area has been known

one of the oldest crust in the world, as reported 3.9Ba. The fundamental geological and geochronological features in Mt. Riiser-Larsen were revealed by JARE38. Based on the results, we (JARE 42 summer party) further studied Mt. Riiser-Larsen region focused on the paleomagnetism, geochronology, electro-magnetism and magnetic anomaly.

To specify the rocks type which caused the large magnetic anomaly, Meta-BIF and dolerite dikes were surveyed around the intersections between the lineation of anomaly and outcrops. Consequently, we found metamorphosed banded iron formation (Meta-BIF) in the intersections. The thickness of Meta-BIF was usually between 0.5 and 1m, but it expanded to 6m. Meta-BIF was frequently sandwiched in pyroxene gneiss, but it contacted directly to felsic gneiss in rare case. When BIF was ended, the layer shrunk with replacing pyroxenite gradually.

Eight Meta-BIF samples were examined by X-ray and fluorescent X-ray analyzers. The result indicated the mineral compositions as Fe₂O₃ and SiO₂ for main composition associated with small amount of MnO:5.5wt%, TiO₂:0-wt%, MgO:1-4.1wt%, CaO:0.73-3.6wt%, Al₂O₃:0-3.0wt%. These elements consisted of magnetite, quartz, anorthite, augite, dolomite, and tremolite. The microscopic analysis showed that the magnetite was scattered as a network structure and deformed resulting from strong shear. The magnetite was almost pure Fe₃O₄ from the Curie point measurement. These chemical composition and mineral assemblage imply the origin of Meta-BIF that was metamorphosed of banded iron formation as described in Pilbara craton, Western Australia.