

## Evolution of migmatite in the Garies area, Namaqualand, South Africa

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The Namaqualand Metamorphic Complex of South Africa is a low P/T type metamorphic terranes, and is a mid to late Proterozoic orogenic belt (Waters, 1989; Raith and Harley, 1998). The metamorphic zonation is studied by Waters (1986, 1991). The highest metamorphic grade reaches to granulite facies around the Garies area, and hercynite + quartz assemblage has been reported.

Granitic rocks are widely distributed in this area, these isotopic ages are 1223 - 1017Ma (Yuhara et al., 2001). Mafic to intermediate migmatite are also distributed in this area. However, genetic relation between the migmatites and the granitic rocks have not been revealed yet.

The migmatite, which is well developed around the Garies, the main component is Bt + Pl + Kfs + Qtz, are studied. The migmatite can be subdivided to three portions, paleosome, leucosome and melanosome.

Paleosome is relatively fine-grained and forms light gray colored layers. The mineral assemblage is biotite + plagioclase + quartz + K-feldspar, and has schistosity. Sometimes 1mm size clots, which consist of epidote + albite + biotite, are observed.

Leucosome is medium grained leucocratic layer in the migmatite. It shows granitic texture and has no schistosity. The mineral assemblage is biotite + plagioclase + quartz + K-feldspar, and is rich in K-feldspar than other portions. In many cases, leucosome rimmed by melanosome.

Melanosome is medium grained melanocratic portions. Melanosome mainly has biotite, plagioclase, and quartz. The portion is relatively rich in biotite, titanite, and zircon, on the other hand poor in K-feldspar. Sometimes melanosome contains 1-2mm size clots which consist with epidote + biotite + albite, and with biotite + titanite + epidote.

Whole rocks major element, minor element, and Sr isotopic compositions of migmatites were analyzed. The results indicate that the paleosome, leucosome, and melanosome are original rock, granitic melt, and restite, respectively. Melanocratic clots such as epidote + biotite + albite, are thought to be formed by retrograde reaction, from pyroxene or amphibole.