Genesis of [Mato sama], concentric structure in Tanzawa tonalite

# Tatsuo Kanamaru[1], Yoshiaki Tainosho[2], Masaki Takahashi[3]


We have been studied the genesis of heptamerous concentric structure, which called [Mato sama], mainly consists of lecocratic rock and melanocratic rock in northern part of Tanzawa tonalite complex. Three concentric structure is occurred in this area, however, we only fined one because of poor outcrop. Diameter of this concentric structure is around 50cm. The concentric structure is surrounded by lecocratic ellipsoidal ring. This ring has about 150cm in diameter. Mafic mineral modal compositions of the inner part of the ring are slightly enriched in mafic minerals compared with that of circumambient quartzdiorite. Lecocratic rock and melanocratic rock that composed of [Mato sama] yield in circumambient quartzdiorite with various occurrence (we can not understand). These occurrence and their texture give us the keys to understand magma flow and crystal settling mechanism.

Melanocratic rock has similar dike or schlieren occurrence. Under the microscope, chadacryst of plagioclase and opaque mineral are included by hornblende mega-oikocryst and residual pyroxene exists. Modal mineral compositions are as follows; hornblende 50%, plagioclase 30-40%, opaque mineral 5%, pyroxene 3-9%, quartz 2-6%. SiO2 content of melanocratic rock is 49-52wt%. TiO2, FeO*, MnO,and MgO content of the meranocratic rock have high compare with that of Tanzawa tonalite, while, Al2O3, CaO, Na2O and P2O5 content of this rock is low.

Leucocratic rocks have similar occurrence of the schlerern and vein. They have also similar occurrence of outer ring of [Mato sama]. Under the microscope, they composed mainly of euhedral plagioclase and small amount of quartz, hornblende and opaque mineral exist interstitially. Modal mineral compositions are as follows; plagioclase 92%, quartz 4%, hornblende 2-4%, opaque mineral 1%. SiO2 content of the leucocratic rocks are approximately 57wt%. Al2O3, CaO, Na2O and P2O5 content of the leucocratic rock have high compare with that of Tanzawa tonalite, while, Tio2, FeO*, MnO and MgO content of this rock are low.

The rock surrounded by outer leucocratic ring of [Mato sama] is slightly enriched in mafic mineral. It contains 60% of modal mafic mineral. On the other hand, circumambient quartz diorite contains 30% of mafic minerals. However, its microscopic texture is similar to the quartzdiorite. SiO2 content of this rock is approximately 50% and Chemical characteristics of the rocks is similar to the melanocratic rock.

Doleritic synplutonic dikes intrude into quartzdiorite in near [Mato sama]. They are 0.5-3m in width and 5-10m in length. Fine grained chilled margin develops at the contact boundary between quartzdiorite and dolerite. This contact boundary is very clear relation and except for some place where dike gradually change into enclave in quartzdiorite. In this case, The synplutonic dike is intruded by quartzdiorite. Groundmass of the dikes have subophitic to intergranular texture. Phenocryst of this rocks consists of subhedral plagioclase, pyroxine and hornblende. They often show glomeroporphyritic texture. SiO2 content of this rock is 45-48wt%. Chemical composition of this dike has high in FeO* and MgO, and poor in alkalis compared with that of enclave in Tanzawa tonalite.