

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

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We have been studying the genesis of heptamerous concentric structure, which is called [Mato sama], mainly consisting of leucocratic rock and melanocratic rock in the northern part of the Tanzawa tonalite complex. Three concentric structures are found in this area, however, we only found one because of poor outcrop. The diameter of this concentric structure is about 50 cm. The concentric structure is surrounded by a leucocratic ellipsoidal ring. This ring has about 150 cm in diameter. Mafic mineral modal compositions of the inner part of the ring are slightly enriched in mafic minerals compared with that of the circumambient quartz diorite. Leucocratic rock and melanocratic rock that composed of [Mato sama] yield in the circumambient quartz diorite with various occurrences (we cannot understand). These occurrences and their textures give us the keys to understand magma flow and crystal settling mechanisms.

Melanocratic rock has similar dike or schlieren occurrence. Under the microscope, a chadacryst of plagioclase and opaque mineral are included by hornblende megacryst and residual pyroxene exists. Modal mineral compositions are as follows; hornblende 50%, plagioclase 30-40%, opaque mineral 5%, pyroxene 3-9%, quartz 2-6%. SiO<sub>2</sub> content of melanocratic rock is 49-52 wt%. TiO<sub>2</sub>, FeO\*, MnO, and MgO content of the melanocratic rock have high compare with that of Tanzawa tonalite, while, Al<sub>2</sub>O<sub>3</sub>, CaO, Na<sub>2</sub>O and P<sub>2</sub>O<sub>5</sub> content of this rock is low.

Leucocratic rocks have similar occurrence of the schlieren 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%. SiO<sub>2</sub> content of the leucocratic rocks are approximately 57 wt%. Al<sub>2</sub>O<sub>3</sub>, CaO, Na<sub>2</sub>O and P<sub>2</sub>O<sub>5</sub> content of the leucocratic rock have high compare with Tanzawa tonalite, while, TiO<sub>2</sub>, 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 quartz diorite. SiO<sub>2</sub> content of this rock is approximately 50% and chemical characteristics of the rocks is similar to the melanocratic rock.

Doleritic synplutonic dikes intrude into quartz diorite in near [Mato sama]. They are 0.5-3 m in width and 5-10 m in length. Fine grained chilled margin develops at the contact boundary between quartz diorite and dolerite. This contact boundary is very clear relation and except for some place where dike gradually change into enclave in quartz diorite. In this case, the synplutonic dike is intruded by quartz diorite. Groundmass of the dikes have subophitic to intergranular texture. Phenocryst of this rocks consists of subhedral plagioclase, pyroxene and hornblende. They often show glomeroporphyritic texture. SiO<sub>2</sub> content of this rock is 45-48 wt%. Chemical composition of this dike has high in FeO\* and MgO, and poor in alkalis compared with that of enclave in Tanzawa tonalite.