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An Outline of High-Pressure Metamorphic Rocks from Bantimala and Barru Complex in South Sulawesi, Indonesia

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Accretionary and metamorphic complexes regarded as Cretaceous subduction complexes of Indonesia are distributed in Central Indonesia include of West and Central Java, South Kalimantan and South Sulawesi. The widely dispersed rocks of the pre-Tertiary basement in the Indonesian region comprise variably metamorphosed accretionary complexes, imbricated terranes, melange, turbidite and broken formations, and ophiolite (Parkinson et al., 1998). These accretionary and metamorphic complexes in South Sulawesi are recorded on the restricted area namely Bantimala and Barru Complex.

Bantimala Complex is a tectonic assemblage of slices and blocks consisting of sandstone, shale, conglomerate, chert, siliceous shale, basalt, ultramafic rocks, schist and schist breccia with the ages of components range from Jurassic to middle Cretaceous (Wakita et al., 1996). The metamorphic rocks are intercalated with melange deposits and mainly consist of high-pressure metabasites and low-pressure metamorphosed clastic sequence rocks. The melange includes clasts and blocks of chert, sandstone, basalt, limestone and schist embedded within a sheared shale matrix (Wakita et al., 1996). K-Ar ages of phengite on garnet-glaucophane rock yields 125-139 Ma and 107-119 Ma, 118-130 Ma on mica rich intercalated with garnet-glaucophane rock, 108-120 Ma and 109-121 Ma for mica-quartz schist intercalated with hematite bearing glaucophane schist (Wakita et al., 1994, 1996) and 134-140 Ma for eclogite (Parkinson et al., 1998). Miyazaki et al. (1996) estimate the peak pressure of the Bantimala eclogites were 18-24 kbar at 580-640 ^{o}C. Parkinson et al. (1998) suggest the pressure and temperature for eclogites and garnet-glaucophane rocks were 18-24 kbar at 580-620 ^{o}C and jadeite-garnet-quartz (coesite) rock were $>$27 kbar at 720-760 ^{o}C.

High-pressure metamorphic rocks in the Bantimala Complex mainly crop out as river boulders. Mafic rocks (eclogite) are the most common comparing to pelitic lithologies such as glucophane schist and garnet-glaucophane-phengite schist. Rarely garnet-jadeite-quartz rock crops out as 3 m wide river boulders in Bantimala River. Meanwhile, the Barru Complex is located approximately 30 km north of the Bantimala area. Metamorphic rocks in this area are crop out more restricted area with most common lithologies are variably of garnetiferous quartz-mica schist and serpentinized peridotite. Wakita, et al. (1994) reported phengite K-Ar age determination from quartz-mica schist of 106 Ma.

The evidence from mineral chemistry analysis, suggests that the Grt-Jd-Qtz rock passed through Jd + Qz stability field during metamorphic evolution. Peak metamorphism of eclogite is represented by garnet rim and omphacite in the matrix. Grt?Cpx thermometer (Krogh, 1988., Pattison & Newton, 1989., and Ravna, 2000) yield a temperature of 720-820 ^{o}C for pressure of 25 kbar on the sample of eclogite 110310T03F. The occurrence of glaucophane inclusions in the core and mantel of garnet indicate the former stability field in the blueschist area. Retrogression observed in the eclogites is represented by replacement of omphacite by actinolite-tremolite-winchite-barroisite amphiboles.

Moreover on the retrogression stage, three types of eclogite are recognized. All of the types are contain garnet and omphacite bearing assemblages. The difference between each type is secondary phase minerals that present during retrogression. Type I of eclogite is dark green eclogite with rich of omphacite in the matrix and less of amphibole or minimally affected by the secondary hydration. Type II of eclogite is bluish colored rich of glaucophane and less of omphacite in the matrix. Omphacite grains in this eclogite are restricted as inclusions on garnet or other minerals. Type III of eclogite is light green-bluish colored dominated by mostly amphiboles in the matrix that ranges in composition from actinolite to barroisite. In these rocks, omphacite is partially to completely replaced by amphiboles.

Keywords: high-pressure metamorphic rocks, eclogite, Bantimala Complex, Barru Complex, South Sulawesi, Indonesia