

**230 Ma ECLOGITE FROM BIBONG, HONGSEONG AREA, GYEONGGI MASSIF,
SOUTH KOREA: HP METAMORPHISM, ZIRCON SHRIMP U-Pb AGES
AND TECTONIC IMPLICATION**

GUO, J.H.¹, ZHAI, M.G.¹, OH, C.W.² & KIM, S. W.³

¹Institute of Geology & Geophysics, Chinese Academy of Sciences, Beijing, 100029, China.

²Department of Earth & Environmental Sciences, Chonbuk National University, Chonju, 561-756, Korea

³Basic Science Research Institute, Chonbuk National University, Chonju 561-756, Korea

e-mail: jhguo@mail.igcas.ac.cn

We report here an eclogite occurrence in Bibong, Hongseong area, southwestern part of the Gyeonggi Massif in South Korea. It outcrops as a lens in Precambrian quartzofeldspathic gneisses together with lenses of ultramafic rocks and HP granulite (or retrograde eclogite) with omphacite inclusions in garnet (OH et al., 2003; 2005). The eclogite preserves traces of four metamorphic stages: eclogite (M1), HP granulite (M2), MP granulite (M3) and amphibolite (M4) facies.

The eclogite facies (M1) mineral assemblage $\text{grt} + \text{omp} + \text{qtz} + \text{ab} (\text{An} < 10) + \text{kf} + \text{rut} + \text{ap}$ is well preserved both within and outside garnet porphyroblasts. The jadeite contents in omphacites are usually in the range of 0.28 - 0.22, and the jadeite contents of omphacites in the matrix can be as high as within garnet, although some omphacites have broken down into fine grained intergrowth of omphacitic cpx + sodic pl. The HP granulite facies (M2) mineral assemblage is $\text{grt} + \text{diopsidic cpx} + \text{pl} + \text{qtz} \pm \text{ilm} \pm \text{amp}$, it is indicated by a coronitic texture of diopsidic cpx + pl around and within garnet. The MP granulite facies (M3) mineral assemblage is $\text{grt} + \text{opx} + \text{pl} \pm \text{diopsidic cpx} + \text{qtz} \pm \text{ilm} \pm \text{amp}$. It is indicated by a coronitic texture of opx + pl \pm diopsidic cpx around and within garnet. The amphibolite facies (M4) mineral assemblage is $\text{grt} + \text{amp} + \text{pl} + \text{ilm} + \text{qtz} \pm \text{sp} \pm \text{ep}$. The feature of this metamorphic stage is the symplectitic texture of amp + pl \pm ilm around garnet. Biotite and chlorite occur in some parts. They represent later alteration. The metamorphic P-T conditions of the eclogite and granulite facies were estimated by the TWQ method. They are (M1): 19.5 - 18.5 kbar and 750 - 800 °C, (M2): 16.5 - 14.0 kbar and 750 - 800 °C, (M3): 11.5-9.0 kbar and 750-820 °C. The amphibolite facies conditions are 5.5 - 7.5 kbar and 600-720 °C calculated by conventional thermobarometers.

These metamorphic P-T calculation results confirmed the HP metamorphism and depicted a clockwise P-T path with significant isothermal-decompressional section (CW-ITD). From eclogite facies (M1) to granulite facies (M2, M3), the metamorphic pressures decreased sharply from 19 kbar to about 9 kbar, with a slight increase in temperature. After the MP granulite facies (M3), the eclogite experienced cooling and uplift. A metamorphic age of 231.2 ± 3.3 Ma has been determined by zircon SHRIMP U-Pb technique. The inferred P-T path and metamorphic age of the eclogite are similar to those of the retrograded eclogite from Weihai area, Sulu UHP collisional belt in eastern China. These results indicate that the western part of the Gyeonggi massif in South Korea may be a possible extension of the Sulu collision belt in China.