# *P-T* paths of the Ultramafic Rocks in the Hongseong Areas

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## Introduction

Ultramafic rock is very important for studing tectonic environments. In many collision belts, ultramafic rocks are commonly reported (Zhang, 1986; Zhai and Yang, 1988; Huber and Marquer, 1999; Zhai et al., 2005). Many ultramafic rocks occurred in the Hongseong area, South Korea, which is an extension of the Dabie-Sulu collision belt in China. Oh et al. (2002, 2004 & 2005) interpreted the Hongseong area, the southwestern part of the Gyeonggi massif, as an extension of the Dabie-Sulu collision belt, based on the Triassic high-P/T metamorphism in that area. The southwestern part of the Gyeonggi massif is very important in the tectonic interpretation of Korea and northeastern Asia. Nevertheless, the ultramafic rocks of this area have never been studied in detail. The purpose of this study is to explain the P-T paths of several ultramafic bodies.

## General Geology and Petrography

The Hongseong area, the southwestern part of the Gyeonggi massif, consists of two different Precambrian basements divided by a NNE fault. Many ultramafic bodies occur mainly as discontinuously isolated bodies, with a dominant NNE trend parallel to the main NNE fault direction in the study area.

The Singok and Baekdong lensoid ultramafic bodies occur in the Deokjeongri granitic gneiss and Wolhyeonri Formation, respectively, and Bibong ultramafic rock occur in the Yugu granitic gneiss.

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**Key words: Gyeonggi massif, Singok, Bibong, Baekdong, ultramafic rock**

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The textures of Singok and Baekdong ultramafic rocks are similar to each other, which shows mylonitic and porphyroclastic textures. However, the Bibong ultramafic rocks show an equigranular-mosaic texture. In Singok and Baekdong ultramafic rock, the orthopyroxene porphyroclasts and olivines are strongly elongated, resulting in a mylonitic texture, which indicates dynamic metamorphism, together with wave extinction in the orthopyroxene porphyroclasts.

**Discussion and Conclusions**

The Bibong ultramafic rocks are dunite and harzburgite of continental arc origin; whereas, the Baekdong ultramafic rocks are harzburgite of passive margin origin. The Bibong ultramafic rocks had not undergone a high-P/T metamorphic event, while the ultramafic rocks of the Singok and Baekdong area had. The Bibong ultramafic rocks show a negative REE pattern and experienced 15-20 % partial melting, the Baekdong ultramafic rocks show a flat REE pattern and experienced 5 % partial melting, and the Singok ultramafic rocks show complex (negative and flat REE patterns) and experienced two degree of partial melting (5, 15-20 %). The metabasite boudin within the Baekdong ultramafic body had undergone high-P/T metamorphism during the subduction that had occurred earlier, during the collision of the North and South China blocks (Oh et al., 2004). Before the collision, passive and active margins formed in the northern margin of the South China block and southern margin of the North China block, respectively, and during the collision the South China blocks subducted under the North China block (Ratschbacher et al. 2003). These data indicate that the Baekdong ultramafic rock may have formed from mantle in the passive margin of the South China block and had underwent high-P/T metamorphism during subduction of the South China block; after high-P/T metamorphism, they were initially isothermally uplifted and then cooled isobarically. On the other hand, the Bibong ultramafic rocks formed from the mantle contaminated by LREE rich fluid originated from the subducted oceanic crust and sediments under the continental arc. They had not undergone high-P/T metamorphism or uplift to the surface along the NNE fault formed after the collision of the North and South China blocks.

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