

Occurrence and U-Pb zircon dating of the Archean Dongshan gneiss in Anshan, the North China Craton

*Hiroki Uehara¹, Tsuyoshi Komiya², Shinji Yamamoto⁴, Yoshiaki Kon³, Yibing Li⁵, Wei Jin⁶

1.Department of Earth and Planetary Science, Graduate School of Science, University of Tokyo, 2.Department of Earth Science & Astronomy Graduate School of Arts and Sciences, The University of Tokyo, 3.National Institute of Advanced Industrial Science and Technology, 4.Graduate School of Environment and Information Sciences, The Yokohama National University, 5.Institute of Geology, CAGS, 6.Univ. Jilin

The Eoarchean geologic terrains are quite rare in the world. Most of them are distributed in the Laurentia, and only two terrains of Anshan, North China and Mt. Sones, Antarctica are outside the Laurentia. The Anshan area in northeastern part of North China Craton is one of a few places, where over 3.8 Ga crustal materials are found, in the world. Previous works reported *ca.* 3.8 Ga zircons from the Baijiafen and Dongshan gneisses (Liu et al., 1992; Song et al., 1996). But, Wu et al. (2008) emphasized that the protolith of granitic gneisses were emplaced at 3.3 Ga, and that the older zircons, up to 3.8 Ga, are inherited. The U-Pb dating and Cathodoluminescence images of the zircons from Baijiafen and Dongshan gneisses, as well as recent Hf and O isotope analyses of the zircons, shows presence of the 3.8 Ga rocks in the Anshan is still controversial (Liu et al., 2008; Nutman et al., 2009; Wu et al., 2008, 2009).

We carried out a comprehensive investigation of detailed observation of an outcrop in the Dongshan area, Anshan, U-Pb dating and Cathodoluminescence observations of zircons from the outcrop to constrain the emplacement age of protoliths of the orthogneisses. The outcrop consists mainly of two lithologies: highly altered metamorphosed mafic rock and orthogneisses with some generations. The orthogneisses are further subdivided into pale-gray gneiss, white gneiss and white granitic intrusion, respectively. The occurrence of the mafic rock and orthogneisses indicates that the mafic rock (1) was intruded by the pale-gray gneiss (2), the pale-gray gneiss (2) was further intruded by the white gneiss (3), and all of them were, finally, intruded by the white granitic intrusions (4). We studied Cathodoluminescence imaging and U-Pb dating of zircons carefully separated from each rock type. The results follow: (1) the metamorphosed mafic rock yields only metamorphic zircons with *ca.* 3.3 Ga ages, (2) only the pale-gray gneiss contains 3.8 Ga zircons, (3) the white gneiss has *ca.* 3.3 Ga zircons and (4) the white granitic intrusion contains very young, *ca.* 500 Ma, zircons.

We will report their protolith ages and the related granitic intrusion events based on the Cathodoluminescence images, U-Pb dating with LA-ICP-MS, Hf and O isotopes and REE patterns of the zircons and whole rock compositions of the host rocks.

Keywords: Archean, zircon, Anshan