

## Primordial Apatite from Ophiolite in Taiwan

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Apatite is a common accessory mineral in igneous rocks. Because apatite has a wide range of trace element compositions as well as strong resistance to diagenetic alteration, the trace element composition of apatite has been used for tracing petrogenetic processes of plutonic bodies as well as the tephrochronology of Paleozoic tephros and Quaternary volcanoclastic deposits.

We studied trace element compositions of apatites from Ophiolite in Taiwan. The Ophiolite with mafic-ultramafic rocks (150811-14) expose along the anticlinal axes of the metamorphic belts in Backbone Range of Taiwan, and exotic gabbro block (MA-15B) in chaotic deposits of Lichi Melange, in the southern end of Longitudinal Valley, in East Taiwan.

Lee (2015 JpGU; Chen et al., 2017 Tectonics) reported that zircon ages of Ophiolites in Taiwan are concentrated to 15 Ma, which should relate with termination of spreading in South China Sea and Shikoku & Parece Vela Basin just before Japan Sea Opening, and large scale igneous activities in the Outer Zone of Southwest Japan just after Japan Sea Opening (Niitsuma & Lee, 2018 JpGU).

Fifteen and twelve apatite phenocrysts from samples of MA-15B and 150811-14 were analyzed for major and minor elements using a JEOL 8530F wavelength dispersive Electron Probe Micro Analyzer (Takashima et al., 2017 Quaternary Geochronology) in weight % as follow;

\_\_major elements: P=17.956 +/-0.100, 17.926 +/-0.129

\_\_\_\_\_Ca=38.362 +/-0.329, 38.128 +/-0.273

\_\_\_\_\_F=1.082 +/-0.151, 0.445 +/-0.046

\_\_trace elements: Cl<0.01, 0.04 Mg<0.01, 0.01 Mn<0.04, 0.05

\_\_\_\_\_Fe<0.03, 0.17 Ce<0.09, 0.05 Y<0.13, 0.04

The contents of trace elements are extremely low and we concluded the apatite might be primordial without any contaminations and petrogenetic effect, and crystallized directly in the magma above rifted mantle along the northwestern margin of West Philippine Basin just before Japan Sea Opening.

Keywords: Apatite, trace element , Ophiolite, Taiwan, Opening of Japan Sea