

## Geochronology and geochemistry of the early Paleozoic metamorphics-igneous complexes of Japan

MIYASHITA, Atsushi<sup>1\*</sup>; TSUTSUMI, Yukiyasu<sup>2</sup>; SANO, Takashi<sup>2</sup>; ITAYA, Tetsumaru<sup>3</sup>

<sup>1</sup>Seikei High School, <sup>2</sup>National Museum of Nature and Science, Tokyo, <sup>3</sup>Okayama University of Science

Early Paleozoic igneous – metamorphics complexes are sporadically distributed over the Japan Arc. These complexes are important to describe beginning of the Japan Island. Each complex has been studied in detail, however, chronological relationship and whole view of them clarified insufficiently.

The metagabbro – amphibolite complex in the Nomo Peninsula is located on the western end of the early Paleozoic igneous – metamorphics complexes. Isozaki et al (2010) pointed out this complex is one of the oldest igneous rocks in Japan. The zircon U – Pb ages of the metagabbro show 491 – 458 Ma. Re-examined amphibole K – Ar ages of the amphibolite are 534 Ma and 468 Ma.

The Kiroko amphibolite (Takeuchi and Makimoto, 1995) is located Yorii-machi, Saitama Prefecture, and situated in the middle part of the early Paleozoic igneous – metamorphics distribution, this rock has 420 Ma amphibole <sup>39</sup>Ar – <sup>40</sup>Ar age, and 555 – 463 Ma zircon U – Pb ages.

The Miyamori ophiolite complex and the Motai metamorphic rocks are north-eastern end of the distribution of early Paleozoic complex in Japan (Ozawa, 1984). The zircon U – Pb ages of gabbro of Miyamori ophiolite are 544 – 420 Ma. The Miyamori ophiolite complex often includes metamorphic rocks that correlate to the Motai metamorphic rocks. The amphibole K – Ar ages of the Ohachimori amphibolites in the Motai metamorphic rocks are 431 – 392 Ma. The amphibole <sup>40</sup>Ar – <sup>39</sup>Ar spectra has not good plateau, however the total <sup>40</sup>Ar – <sup>39</sup>Ar ages show 508 – 432 Ma.

The zircon U – Pb ages and amphibole K – Ar ages have good agreement with these complexes. An important note is that these amphibolites of early Paleozoic age were not suffered HP metamorphism, suggesting that their geochemical characteristics will be used to estimate tectonic setting.

The bulk rock chemistry of amphiboles belongs to basalt or basaltic andesite. The chemical feature of metagabbros and amphibolites belongs to calc-alkaline series, and is supposed to have an intra-oceanic arc/remnant arc characteristics.

### References:

- Isozaki et al. (2010) *Gondwana Res.*, 18, 82 – 105.
- Takeuchi and Makimoto, (1995), *Bull. Geol. Surv. Japan*, 46, 419 – 423.
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