

## The Kiroko greenstone melange of the Atokura Nappe in the Yorii-Ogawa district, central Japan

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The Atokura Nappe is distributed in the Yorii-Ogawa district of the northeastern margin of the Kanto Mountains. The Kiroko greenstone melange is exposed in the southern margin of the Atokura Nappe. The greenstone melange is composed of Kiroko metamorphic rocks, serpentinite and various tectonic blocks. The tectonic blocks are considered to be captured by the Kiroko metamorphic rocks and serpentinite in the course of their rises toward shallow crust. K-Ar datings for the Kiroko greenstone melange were carried out for two samples by the present writer. The Kiroko-M sample is a greenstone. The Iyo-mus sample is a biotite-garnet-muscovite schist which is exposed in Iyo, East Chichibu village.

The Kiroko-M sample was made from several hand specimens. Lenticular portions with various colors such as pale-green, gray, white and black are observed for the hand specimens (Figure 1). The lenticular portions are of about 1-3cm in length and less than 5mm in thickness. Radiolarians are rich in white siliceous parts although they are also common for other portions. Black pelitic lenses are composed of fine actinolite, chlorite, white mica, quartz and carbonaceous material. The small white mica has a great impact on the K-Ar age of the Kiroko-M sample.

Pelitic metamorphic rocks of the Kiroko greenstone melange were previously described as slates or mudstones. Recrystallizations of minerals are good in spite of the low metamorphic temperature. Preferred orientation of muscovite is clear in many cases. The sizes of muscovite grains depend on each rock sample. It is very small in some cases. Two kinds of muscovite with respect to grain sizes are observed for all the studied samples. Larger muscovite grains are considered to be detrital ones. Secondary minerals are hardly observed although quartz veins are present frequently.

K-Ar dating was carried out for two pelitic rocks, Kiroko-P and Suguro-P. The results are 117Ma and 126Ma, respectively (Figure 1). Considering the common occurrences of detrital muscovite grains, the measured K-Ar ages are considerably older than cooling ages of metamorphic minerals.

Mid-Cretaceous granitic and metamorphic rocks are tectonic blocks of the early Paleogene Kiroko greenstone melange. The Kiroko metamorphic rocks and serpentinite exhumed to the shallow crust where mid-Cretaceous granitic and metamorphic rocks were distributed. The mid-Cretaceous granitic and metamorphic rocks were largely transported toward an oceanic plate before 60Ma and were situated at the margin of the Paleogene forearc region where the exhumation of high-pressure type metamorphic rocks took place. Similar tectonic shortenings occurred after 60Ma in the forearc region of Southwest Japan. The formation of the Atokura Nappe is an evidence for the tectonic contraction.

Keywords: greenstone melange, Atokura Nappe, slate, K-Ar dating, detrital white mica

