

岡山大学固体地球研究センター共同利用研究報告書（平成 15 年度）

研究題目：ヒマラヤ変成帯の形成史に関する研究

Studies of evolutionary history of the Himalayan metamorphic belt

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ヒマラヤ変成帯の形成史は近代的な手法によって再検討する必要がある。この研究課題を「共同利用研究」としてどのように推進していくかについて打ち合わせを行うと共に、パキスタン・ヒマラヤにおける最新の地質調査と岩石記載学的研究の成果について講演した。講演の要旨は以下のとおりである。

Title: Geology of Upper Kaghan Valley, Pakistan Himalayas

Abstract:

The present research deals with the Northwestern Himalayas in Pakistan, where the Eurasian Plate collided with Indian Plate at a subduction collision boundary sandwiching an ancient Kohistan Island arc (Tahirkheli, 1979). About 120ma the Indian Plate started moving north ward at a rate of about 3~5cm/y. Due to this northward movement the Island arc collided with Eurasian plate about 102 ma ago, but still the movement continued and at about 53million years ago, the Indian plate collided with the Island arc. As a result of this tectonic activity, strong deformation occurred in that part of the world, giving birth to high Pressure regional metamorphism and metasomatism.

This research deals mainly with the Pelitic Schists; Gneisses; Mafic and Ultra-High Pressure (UHP) metamorphic rocks in the northwestern Himalayas of the Indian plate. These rocks sequence follow a classic example of Barrovian metamorphic sequence.

The UHP rocks (Eclogites) in the Higher Himalayan Sequence are Na rich & bear coesite, an indicator of UHP conditions.

The age of eclogites is assigned as Eocene-Oligocene (Treloar et. al., 1989, Tonarini et al., 1993). According to Kaneko et al., (2003) the $^{206}\text{Pb}/^{238}\text{U}$ zircon ages reveal that the quartz-bearing mantle domains and the coesite-bearing rim within eclogites and surrounding gneisses of the HHS were formed at ~50 Ma and 46.2 ± 0.7 Ma.

The coesite bearing eclogites are formed at a depth of about 110km, at temperature range of about 700~770°C and pressure of about 27~32 Kilobars using garnet-pyroxene-phengite geobarometry and garnet-pyroxene geothermometry (Kaneko et al., 2003).

Key words: Upper Kaghan Valley, Himalayas, Tectonic Activity, Barrovian Sequence, UHP Metamorphism, Eclogites, Coesite, Geothermobarometry