Characteristic gabbroic conglomerates found in the Mineoka-Setogawa belt, central Japan

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The Mineoka belt in the Boso Peninsula, the Hayama belt in the Miura Peninsula, the Kobotoke belt in the southern Kanto mountains and the Setogawa belt in Central Japan, which belong to the southern Shimanto belt, are collectively called 'Circum-Izu Massif Serpentin Belt (CIMSB)' by occurrence of petrologicaly similar serpentinite (Arai and Ishida,1987). In addition to the serpentinites, ophiolitic rocks, such as gabbros, basalts and pelagic sendimentaly rocks are exposed in this zone. Especially, basalts are reported to have a character of MORB, and are inferred to be a fragment of an oceanic plate (Ogawa and Taniguchi,1987). However, island-arc type rocks have been recently found out in the belts (Hirano and Okuzawa,2002).

The authors found gabbroic conglomerates in the Mineoka and Setogawa belts, and we report their geological and petrological character to consider a tectonic process of their appearance.

In the Mineoka belt, rocks are sheared and deformed by many faults inferred to be active even now, and their distribution is intricate. The gabbroic conglomerates are exposed sporadically along the southern fault of the belt. They are composed mainly of gabbros and subordinately of microgabbros, basalts, meta-basalts, diorites, rhyolites and andesites. Mineral assemblages and modal ratios of minerals of gabbros are varying from piece to piece. They show ill sorting and are free of sedimentary structures. Some fragments are pull-apart into portions. These features suggest tectonic deformation. Combined with the great lithological variety of pebbles, we interpret that the rocks are either tectonic conglomerates or sedimentary ones modified by deformation. Serpentine sandstone appears at the extention of the conglomerates, indicating the same manner of formation.

The Setogawa belt consists of several tectonic units limited by faults. Gabbroic conglomerates appear near the lowermost part of 'Odake thrust body' (Sugiyama and Shimokawa,1989) . They partly show monomictic character, composed each of gabbros, diorites and meta-basalts, but they are mixture of various kind of rocks similar to the Mineoka belt in some case. They localy shows bedding, and so the conglomerates are partly sedimentary.

Gabbros in the conglomerates show various mineral assemblages. In the Mineoka belt proper, hornblende gabbros are common, but pyroxene gabbros with clinopyroxene and/or orthopyroxene are marked in the conglomerate. Furthermore, olivine-bearing gabbros not recognized in the Mineoka belt proper are contained in the conglomerates, and olivine-bearing clinopyroxenites with a little plagioclase are found. In the Setogawa belt, gabbros also have various mineral assemblages in conglomerates. Clinopyroxenites are found, but olivine-bearing pyroxene have not been found.

High Mg# [100*Mg/(Mg+Fe)] of mafic minerals and high An content of plagioclase are characteristic of the gabbro pebbles. The feature suggest arc setting rather than oceanic setting (Beared,1986). Furthermore, abundance of quartz-rich diorites does not suggest oceanic setting.

Provenance of their arc-type gabbros is forearc of the Honshu arc (Southwest Japan arc) and the Paleo-Izu arc accreted. The gabbros in the conglomerates are, however, similar in composition in gabbros from neither SW Japan arc nor Paleo-Izu arc. Formation of the conglomerates in the Mineoka belt and the Setogawa belt indicates large-scale injection of lower crust materials widely along the frontal part of the Southwest Japan arc. Their age of formation has not been known.