

## Comparison of UHP chromitites from the Higo and Nishisonogi Metamorphic Rocks, Kyushu, Japan.

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We have found microdiamond - bearing ultrahigh-pressure (UHP) chromitites from two metamorphic terranes in Kyushu: the Higo (HMR)<sup>1</sup> and Nishisonogi (NMR)<sup>2</sup> Metamorphic Rocks. This paper describes the similarity and difference between the two UHP chromitites. The HMR are located in west-central Kyushu with an E-W trend. They have undergone low P /T metamorphism, however, precursor HP or UHP metamorphism of ca. 250 Ma has been inferred<sup>3</sup>. The protoliths have affinity to continental shelf deposits<sup>4</sup>, consisting mainly of pelitic gneisses and meta-carbonates with minor metabasites and metaperidotites (partly serpentinite). Chromitite occurs very rarely as a nodular form in serpentinitized metaperidotites which shows spinifex-texture. The NMR is located in western Kyushu with a N-S trend. They have undergone high P /T metamorphism of epidote-blueschist subfacies. They consist mainly of pelitic and psammitic schists with minor basic schists and serpentinites, some of which show a character of serpentinite melange<sup>5</sup>. Detrital zircon from the pelitic schists show the age of 89-86 Ma<sup>6</sup>, whereas zircon from jadeitites in a serpentinite melange does 136 -126 Ma in the core and 84 - 80 Ma in the rim<sup>7,8</sup>. Chromitite occurs as a deformed schlieren-like layer in serpentinite with no relic minerals. The P-T condition of the HMR has been estimated to be 200 - 600 MPa and 600 - 800 °C<sup>3,9,10,11,12,13</sup>. Higher pressure and temperature conditions are reported from the following two samples: a sapphirine-bearing granulite<sup>3,10</sup> as a tectonic block in the spinifex-textured metaperidotite (900 MPa and 950 °C) and a calc-silicate granulite<sup>13</sup> (900 MPa and 820 °C) intercalating with garnet - biotite gneiss. We newly estimated the peak P-T condition of Al-spinel and chlorite -bearing metaperidotite as 2.0 GPa and 780 - 990 °C. In the case of the NMR, the peak metamorphic condition of the crystalline schists is 1.4 GPa and 520 °C for a garnet galucophanite<sup>14</sup>. Jadeitites<sup>15</sup> as tectonic blocks in the serpentinite melange shows the peak condition of 1.5 GPa and 500 °C. Chromite from the HMR has the composition  $(\text{Mg}_{0.34}\text{Fe}^{2+}_{0.75}\text{Mn}_{0.02})(\text{Cr}_{0.81}\text{Al}_{0.06}\text{Fe}^{3+}_{0.04}\text{Si}_{0.05})_2\text{O}_4$ , whereas that from the NMR has similar composition  $(\text{Mg}_{0.33}\text{Fe}^{2+}_{0.65}\text{Mn}_{0.03})(\text{Cr}_{0.84}\text{Al}_{0.12}\text{Fe}^{3+}_{0.04})_2\text{O}_4$  in the core and Fe-rich composition  $(\text{Mg}_{0.06}\text{Fe}^{2+}_{0.89}\text{Zn}_{0.02}\text{Mn}_{0.03})(\text{Cr}_{0.85}\text{Al}_{0.12}\text{Fe}^{3+}_{0.04})_2\text{O}_4$  in the rim. Microdiamonds occur as *in situ* inclusions in chromite in both chromitites. They are 1 to 10 μm in size in HMR chromite, and those in NMR chromite is much smaller, mostly <1 μm with small number of larger grains. In both chromitites microdiamonds occur in some cases as numerous aligned grains, making diamond - rich zones. Both microdiamonds are identified with Raman spectra. HMR microdiamonds show a broad peak at 1333 cm<sup>-1</sup>. NMR microdiamond, also shows a broad peak at 1331 cm<sup>-1</sup> with graphite peak at around 1600 cm<sup>-1</sup>, suggesting partial graphitization. Both UHP chromitites will be deep subduction origin. HMR can be an eastern extension of the Dabie-Sulu UHP terrane in China, however, NMR is more problematic. No corresponding UHP terrane of ca. 80Ma is found around Kyushu. Our findings of UHP chromitites require reexamination of micro-tectonics in Kyushu, a peculiar location of an arc-arc junction at the continental margin.

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