Rock-magnetic study on MR01-K03 sediment cores from off Kushiro and off Shimokita, northwest Pacific

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We have conducted rock-magnetic analyses of two sediment cores obtained during the R/V Mirai cruise MR01-K03 in order to reconstruct paleoenvironmental changes in the northwestern Pacific.

The chronologies of two cores can be well correlated by means of paleomagnetic results. The ages of both cores will be presented on the meeting as the radiocarbon dating will be finished until that time. Considering the age information of nearby cores, our cores are expected to cover last tens of thousands years.

An abrupt change of magnetic mineralogy and granulometry was recorded in core PC-06 from off Kushiro (42 deg 21'N, 144 deg 13'E) in a water depth of 1066 m. Magnetic hysteresis loops and high-temperature magnetic susceptibility profiles indicates dominance of multidomain magnetite grains at the lower part of the core (4.2 to 7 m) and existence of single domain and thermally unstable magnetic mineral (provably iron sulfide) at the upper part of the core except the uppermost oxidized layer (0.5 to 4.2 m). Sudden decrease of extensive magnetic parameters, such as magnetic susceptibility, ARM susceptibility and SIRM, also reflects the change of magnetic mineralogy as well as concentration of magnetic minerals.

In contrast, there was no significant change of magnetic minerals in core PC-04 from off Shimokita (41 deg 07'N, 142 deg 24'E) in a water depth of 1363 m, except for some ash layers which are marked by keen peak of magnetic parameters. Magnetic hysteresis loops and high-temperature susceptibility profiles are similar to those of the upper part of core PC-06, and indicate presence of iron sulfide.

The lower part of core PC-06 may corresponds to different environment from present. As magnetic iron sulfide is formed under anoxic environment of sea bottom or pore water, or plenty of organic input, absence of magnetic iron sulfide may reflect conditions such as supply of well oxygenated water or decrease of organic material.