

Rock magnetic characteristics of marine sediments from the east of the Okinawa Island

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The Okinawa Island is located in the western margin of the subtropical North Pacific. In order to investigate marine geology and environment off the east of the Okinawa Island, samples of surface sediments were collected from the area during the R/V Hakureimaru No. 2 cruise in 2008. We investigated sedimentary environments to the Okinawa Island, based on magnetic properties of the surface sediments. Rock magnetic properties change with variations in the abundance, type, and grain size of magnetic minerals. These properties have been used as proxies of sedimentary environments. Samples for magnetic measurements were taken with 6.7 cc plastic cubes. Measurements of magnetic susceptibility (k), anhysteretic remanent magnetization (ARM), and isothermal remanent magnetization (IRM) were performed on the cube samples. In order to identify the magnetic minerals, low-temperature magnetometry was performed. The results showed a slight decrease in the thermal demagnetization of IRM at about 100 K for all samples. This change is interpreted to be the Verwey transition of magnetite. The mineral diagnostic parameter, $S_{-0.3T}$, displayed high values above 0.95 in the offshore area, and slightly lower values were observed in the coastal area. This suggests that high coercivity magnetic minerals (like hematite and goethite) are relatively abundant in the coastal area. The indicators of magnetic mineral concentration, k , k_{ARM} , and $IRM_{2.5T}$, showed relatively lower values near the coast than the offshore area. Medium-fine grained particles (e.g., foraminifera sand) are distributed above the water depth of 2300 m. It is inferred that the amount of magnetic minerals are lower near the coast, and that the magnetite concentration are diluted by the supply of foraminifera sand.