

沖縄本島東沖の海底に分布する磁性粒子の特徴

川村 紀子 [1]; 山崎 俊嗣 [2]; 小田 啓邦 [3]
[1] 海上保安庁・海保大; [2] 産総研・地質; [3] 産総研・地質情報

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

Noriko Kawamura[1]; Toshitsugu Yamazaki[2]; Hirokuni Oda[3]
[1] JCGA; [2] GSJ, AIST; [3] IGG, GSJ, AIST

<http://www.jcga.ac.jp/>

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 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. Selected samples of 0.3-1 mg from the cubes were prepared for magnetic hysteresis analysis. Coercivity (H_c), remanent coercivity (H_{cr}), saturation remanent magnetization (M_r) and saturation magnetization (M_s) were obtained with an alternating gradient-force magnetometer. 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. H_{cr}/H_c and M_r/M_s showed that samples were in the area of pseudo single domain, however some samples from offshore area located upper left corner. 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 , $kARM$, 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.