釧路沖海底表層堆積物の環境岩石磁気研究

Fitriani Dini[1]; # 山崎 俊嗣 [2]; 野田 篤 [3]
[1] パジャジャラン大学; [2] 産総研・地質; [3] 産総研・地質情報

Study on environmental rock magnetism of surface sediments off Kushiro, Hokkaido, Japan

Dini Fitriani[1]; # Toshitsugu Yamazaki[2]; Atsushi Noda[3]
[1] Padjadjaran Univ; [2] GSJ, AIST; [3] GSJ/AIST

http://stuff.aist.go.jp/toshi-yamazaki

The Geological Survey of Japan, AIST, has been conducting marine geological mapping of continental shelves and slopes around the four major islands of Japan for more than 25 years, and the results have been published as a series of Marine Geological Maps and Sedimentological Maps of 1/200,000 scale. Under this project, surface sediments off Kushiro, Kokkaido, were collected at 80 sites at intervals of several miles using a grab sampler during the GH03 cruise of the R/V Hakurei-maru No.2. Using the sediment samples, we conducted a study on envrronmental rock-magnetism. The purpose of this study is to confirm applicability of rock-magnetic methods to sedimentological problems by comparing magnetic properties with sedimentological data, and to obtain additional information on depositional environment. Sediments at most sites have S ratio (S-0.3T) of higher than 0.95, indicating that the remanent magnetization is dominantly carried by low-coercivity magnetic minerals like magnetites. Sediments around the edge of the continental shelf have larger average magnetic grain sizes than those in other regions. This is consistent with the results of grain size analyses by sedimentological methods, in particular, those represented by the fineness modulus. The two magnetic grain-size proxies, the ratio of ARM susceptibility to low-field magnetic susceptibility (X) and the ratio of SIRM to X, showed similar geographical distribution. However, another magnetic grain-size proxy, ARM/SIRM, did not show coherent variation. The sediments of this region are classified into silt and sand according to their grain sizes represented by the phi scale. If grain size distribution of magnetic minerals are similar to other particles, the majority of magnetic grains are estimated to be in a multi-domain (MD) range, which is supported by the results of magnetic hysteresis measurements. Grain-size dependence of ARM acquisition efficiency is particularly large in a smaller single-domain (SD) range, but in a MD range it would not differ significantly from SIRM. Hence ARM/SIRM would not work well as a grain-size proxy for relatively coarse sediments.