EGU22-863
https://doi.org/10.5194/egusphere-egu22-863
EGU General Assembly 2022

Characteristics of non-spherical manganese nodule from the East Siberian Sea

Hyen Goo Cho, Hyo-Jin Koo, Mu Seong Park, and Chung Man Seo
Gyeongsang National University, Geology, Jinju, Korea, Republic of (hgcho47@gmail.com)

Manganese nodules have been found in the shallow water depth of the Arctic Ocean as well as in the abyssal plains of the Pacific and Indian Oceans, but detailed study for them were rarely investigated. Manganese nodules, collected from the East Siberian Sea through the Arctic Expedition using Araon ice braking vessel, have a high potential for Mn mineral resources because they have high Mn content with high Mn/Fe ratio. This study investigated the external form, size and weight, internal texture for the non-spherical manganese nodule, which has about 7 % of total nodule from the East Siberian Sea. This study also researched the relative Mn-oxide mineral composition using the peak area ratio of X-ray diffraction pattern and their chemical composition. All data obtained from non-spherical nodules were compared with the spherical ones. Ellipsoidal, platy and irregular types are common among 5 groups of non-spherical manganese nodule based on the external form, and major axis and weight have positive relationship. All non-spherical manganese nodules have core mainly composed of mud sediments. The average Mn oxide mineral contents in nodules are birnessite, buserite and todorokite in descending order. Although mineral composition does not show any correlation with the external form, kind of core or internal structure, todorokite and buserite contents tend to increase and birnessite content decrease from the surface to the core in the nodule. Non-spherical manganese nodules have higher Mn content and Mn/Fe ratio than those from the shallow water depth of the Arctic Sea and even in the deep-sea of the Pacific and Indian Ocean. Almost all manganese nodules from this study are attributed to diagenetic process, because they are higher than 5 in Mn/Fe ratio.