

Geochemical Map in Japan

Noboru Imai[1]; Masumi Mikoshiba[2]; Atsuyuki Ohta[3]; Takashi Okai[4]; Ken Ikehara[5]

[1] AIST; [2] Geological Survey of Japan, AIST; [3] GSJ, AIST; [4] Institute of Geology and Geoinformation, GSJ/AIST; [5] IGG, AIST

The land and coastal marine geochemical map covering whole country are formed to evaluate the distributions of toxic elements in natural background level. About 3,000 stream sediments and 5,000 bottom sea sediments are collected from Japan. The number of elements analyzed are 53 including toxic elements of As, Be, Cd, Hg, Mo and Sb.

In land, high As and Pb concentrations of several regions are attributed to the mineral deposits (mimes) such as Osarizawa, Ashio, Hitachi, Ikuno and Besshi mines. Other elements of Bi, Cd, Cu, Sb and Zn show the same types of distributions. The geochemical maps of Cr and Ni show the high concentrations along the tectonic lines in Hokkaido, Shikoku, Kinki regions, which are thought to be caused by the ultramafic rock (serpentinite) distributed in these regions. The concentrations of K₂O, Li and Rb are high in the south of Japan where acidic rocks (granite and rhyolite) are mainly distributed, and Sc and V are high in concentrations in the north of Japan where basic rocks (basaltic rocks) are mainly distributed.

The coastal marine geochemical maps are also formed from the concentrations of the elements in the marine sediments by GIS system. The high concentrations of Cr in Hokkaido, Tokai and Hokuriku regions which decrease from land to coast are attributed to the ultramafic rocks distributed in the hinterland of the river. The MnO is concentrated in the deep sea sediments in the Japan Sea. The enrichment is mainly due to the upward and lateral migration of dissolved MnO from deeper sedimentary layers. The high Hg concentrations of off shores of Yatsushiro and Niigata are attributed to the past serious pollutions of Hg from factories in land. The As, Cd, Cu, Pb and Zn show high concentrations in the Tokyo Bay, the Osaka Bay, the Ise Bay and the Toyama Bay. The reason for the high concentrations of the elements in the bay sediments is mainly due to the pollutions from human and industrial activities in land.