4.62.P05

Assessment of heavy metal pollution in Katedan industrial area, Hyderabad, India

P. GOVIL[1], J.E. SORLIE[2], N.N. MURTHY[1], K. RUDOLPH-LUND[2], G.L.N REDDY[1], A.K. KRISHNA[1], D. SUJATHA[1] AND K. RAMA MOHAN[1]

[1] National Geophysical Research Institute, Hyderabad, India (govilpk@rediffmail.com)
[2] Norwegian Geotechnical Institute, Oslo, Norway (Jan.Erik.Sorlie@ngi.no)

Environmental geochemical studies were carried out at Katedan industrial development area (KIDA) near Hyderabad, capital of Andhra Pradesh state, India under Indo-Norwegian institutional cooperation programme, to find out the extent of contamination in stream and lake sediments from the discharge of industrial effluents. The studies reveal that the stream sediments with in the KIDA and the impounded Noor Mohammed Lake down stream have high concentration of some of the toxic elements like chromium, nickel, lead, arsenic, zinc etc. The geology of the area indicates that study area consists of residual soil of acidic rocks, which are predominantly Achaean gneisses and granites having low to medium concentrations of chromium and nickel. The source of these high concentration elements could be the industrial effluents released in the ditches and randomly dumping of hazardous solid waste.

It was observed that, in general, the metal concentrations increased in the streams during the dry season (pre-monsoon period. After the monsoon rains, the metal concentrations in the streams were reduced by half. The eroded sediments are deposited in the lake where very high concentrations were encountered. Overflowing at the lake will spread the contamination further downstream. The lake sediments will remain as a major source of contamination by desorption to the water phase regardless what happens to the effluent discharge in the KIDA. However, some samples showed enrichment of lead during post-monsoon, which were collected near the dumpsite. Some of the toxic elements like nickel and copper have not shown any dilution but have increased after the rains, which could be due to the leaching of arsenic from the dumpsite to the lake along with rainwater.

Geochemical maps showing the distribution of heavy/trace elements in streams and lakes are prepared and presented in this paper along with correlation coefficient diagrams.

4.62.P06

Coral skeletal lead; human activities recorded in coral skeleton

T. TSUNODA[1], A. SUZUKI[2], H. KAWAHATA[2], M. NOHARA[2] AND N. SHIKAZONO[1]

[1] Keio University, 3-14-1, Hiyoshi, Kohokuku, Yokohama, Kanagawa, Japan (tsunoda@qc4.so-net.ne.jp; sikazono@applc.keio.ac.jp)
[2] National Institute of Advanced Industrial and Science Technology, 1-1-1, Higashi, Tsukuba, Ibaraki, Japan (a.szuki@aist.go.jp; h.kawahata@aist.go.jp; m.nohara@aist.go.jp)

Chronology of lead marine pollution in the twentieth century for Ishigaki Island, the Ryukyus, Japan was reconstructed from ICP-MS analysis of annually banded coral, *Porites* sp.. So coral skeletons are composed by aragonite, CaCO3, and steady in seawater that the environmental information recorded when it was formed are kept for a long period of time, i.e. water temperature is reconstructed by oxygen isotope and solar radiation is done by carbon isotope.

Corals also take environmental elements into their skeletons depending on their concentration. That past environmental concentrations of the elements are able to be assumed from their concentration in the coral skeletons. However, the concentrations are very small that the influence of secondary contamination is not negligible and suitable cleaning is needed.

A cleaning method similar to method of Shen and Boyle(1988)[1] widely accepted is tested and was confirmed to be effective for genus *Porites*.

As a result of analysis, it was found that low level lead concentration in the coral skeleton begins increase with the change of the time in the 1980s. Though it is supposed to be caused by human activity, gasoline was already unleaded and no lead source i.e. mine or factory exist nearby Ishigaki Island.

It is known that various substance is brought from China to Japan by the prevailing westerlies. China greatly depends on coal which releases lead with its smoke to generate energy. It is supposed that the increase of coral skeletal lead is the record of rapid increase of lead release to air caused by increase of consumption of coal along the growth of Chinese economy.

References

[1] Shen G.T. and Boyle E.A. (1988) *Chemical Geology*, **67**, 47-62.