Abstract

In Japan, Pesticides containing DDT, Endrin etc as their active ingredients had been registered, but the registration was later withdrawn due to their toxicity. These pesticides were then stored underground as a measure of pollution prevention in the 1970s.
The Stockholm Convention on Persistent Organic Pollutants (POPs) was adopted in 2001, and as a consequence, it was decided that the pesticides stored underground would be excavated and treated properly so as to irreversibly destroy the POPs content.
Till date, Ministry of Environment (MoE) has prepared a provisional manual for the excavation and storage of the pesticides stored underground prior to POPs destruction treatment and has also been carrying out technical investigations regarding the proper treatment of excavated pesticides containing POPs with focus on thermal treatment.
This study, conducted during the FY 2007 focused on the following topics.

a. Investigation on the thermal treatment of pesticides containing POPs that also contain/ or exist together with Mercury and/or Arsenic.

Pesticide feed containing POPs , Mercury and Arsenic was fed into a thermal treatment unit (composed of roaster furnace (800 - 900℃) and a secondary combustion chamber (1000℃)) . The exhaust gas treated with a gas treatment facility comprising of a Gas Quencher, Venturi Scrubber, EP, Mist Eliminator, and Activated carbon. The result obtained showed a destruction and removal ratio of over 99.999% for POPs and the concentration of the pollutants in the exhaust gas (including dioxins) was within the emission standard stipulated by the respective laws (namely, “Air Pollution Control Law” and “Law Concerning Special Measures against Dioxins”).

b. Investigation of analytic methods (usable at excavation sites) that can be used to determine the concentration of Mercury and Arsenic included in excavated pesticides containing POPs.

Contaminated soil containing Mercury, Arsenic, POPs and other ingredients was analyzed (for Mercury and Arsenic), at the excavation site for stored pesticides using fluorescence X-Ray analysis apparatus. The result was compared with the values obtained from standard laboratory tests conducted on the same samples. Results showed that at lower concentrations of Mercury(0-20ppm) and Arsenic(0-150ppm) a large difference was observed between the values obtained from the fluorescence X-Ray analysis apparatus and the standard laboratory tests. Hence it was concluded that the usage of fluorescence X-Ray analysis apparatus for analysis of Mercury and Arsenic should be carried out by appreciating the fact that there can be a difference in the values, as compared to the result obtained from standard laboratory tests.

c. Revision of the manual for the excavation and storage of pesticides stored underground.

The manual for the excavation and storage of pesticides stored underground was revised by incorporating the idea behind the Soil Contamination Countermeasures Law of Japan in the handling and treatment of soil polluted by POPs.

Revision was made to the manual allowing for measures other than immediate excavation and treatment (such as land-filling, covering, monitoring of underground water around the site etc) for soil contaminated with POPs, but with concentrations less than the standard stipulated in the manual.