PIXE analysis of soil and water samples around a disposal site southwestern Miyagi prefecture, Japan

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Abstract

Two cored geological columnar samples around the waste disposal site in southwest Miyagi prefecture, Japan have been chemically investigated by PIXE to check how much the geological formations were polluted. The samples were treated by strong acid and we tried to extract adsorbed elements as much as possible. Also exuded wastewaters were analyzed. To compare to those samples, river waters were analyzed as well. Although the surrounding geological formations were not contaminated by toxic heavy metals, a lot of sulfur has been transported from the disposal site. Such heavy metals as Pb and Cu seem to be transported to the surrounding formations. None of those elements does not intrude into deep geological formation and just simply transported horizontal direction. In contrast, highly toxic elements (As, Cd, Hg,) have not diffused from the disposal site. The disposal site may not include toxic waste that contains As, Cd or Hg. While As, Hg and Pb were found in permeable formation, most of them may be artificial and historical pollution. Exuded wastewaters contain a little amount of Cr, Pb, Cu and Hg. No As was detected from the wastewaters. Rather high contents of those elements could be due to the sampling time when the wastewaters were collected during drying period.