

*A Case Study :*

## Mercury contamination due to thermometer glass solid waste dumping - A preliminary report

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### ABSTRACT

There is a report on the Hg contamination due to the waste glass coated with mercury dumped by a thermometer factory at Kodaikanal, Tamil Nadu. Water samples from various zones of the lake located at Kodaikanal were subjected for the spectrophotometric method of Hg content. The results have disclosed that there is an elevated level of Hg. The data was analysed statistically and discussed with relation to the contamination of Hg.

**Key words :** Hg contamination, Hg Pollution from thermometer factory, Environmental Hg in water analysis

Mercury (Herein quoted as Hg) pollution in water is emerging as an alarming situation due to discharge of elemental mercury spills, industrial effluents containing mercury salts and solid waste such as mercury coated glass waste (Clarkson, 1994; Jayaprakash, 2009). It is known that Hg in water bodies due to industrial effluent ranges from 0.058 to 0.268 mg./L against the normal safe limit of 0.001 mg./L (WHO, 1980; ATSDR, 1999). It has been worked out by many authors that Hg concentration is higher in water bodies closer to industries using elemental mercury or mercury based raw materials. It is established that the Hg level is as high as 0.176 mg./L in water samples analysed from in and around chlorine industrial areas (Rudd, 1995).

Similarly, the Tamil Nadu Pollution Control Board (TNPCB) has confirmed that Hg contaminated glass pieces were dumped at various locations in Kodaikannal by a thermometer factory of Unilever Ltd., The waste described as scrapyards contains more than 50 mg/kg (Report of Human Right, 2003). It has been suggested that because of above Hg discharge, the water available in and around Kodaikannal lake may be polluted Hg pollution. Although the factory was closed because of the legal dispute, still there has been a controversy over this hypothesis and the level of Hg concentration in water as well as soil (Sharma, 2003; Rajagopal, 2003).

By holding the above hypothesis, a preliminary attempt has been made in the present study to ascertain the Hg concentration levels in water samples collected from various zones of Kodaikannal lake, Kodaikannal, Tamil Nadu.

### MATERIALS AND METHODS

The spectrophotometric method using 2-acetylthiophene benzoyl hydrazone (ATBH) as adopted by Saleem Basha *et al.* (2009) was employed for the determination of Hg in water samples collected from various zones of Kodaikannal area during the period between January 2010 to March 2010.

250 ml of each water sample was filtered with whatman No. 40 and added with conc. HNO<sub>3</sub>. Then the samples were digested by potassium permanganate solution as suggested by Fifield and Haines (2000). The reagent (ATBH) was prepared by mixing 1 mole of 2-acetylthiophene and 1 mole of benzoyl hydrazide in a 250 ml flask. The shiny yellow crystals were filtered and dried in vacuum. To get 90% yield, the solution was refiltered again and again.

The Hg compound was determined by UV spectral analysis. The standard Hg solution (1x10<sup>-2</sup>M) was prepared by HgCl<sub>2</sub> in acetate buffer at pH 4-6. The absorbance was measured at 350-600nm range against blank.

In each case 10 samples were analysed and mean was calculated. The data on Hg values for different zones (A, B, C, D, E, and F) were compared with Hg level obtained for unpolluted water, which was maintained as control unit. The data were analysed statistically and student 't' test was employed to know the significance at 95% confidence level (P<0.05).

### RESULTS AND DISCUSSION

The results of Hg analysis of control water (unpolluted ground water) as well as six different water