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Survey of tri halo methanes (THM) in public water supplies

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In almost all water treatment processes for human consumption, chlorine is the most commonly used disinfectant due to its effectiveness and low cost to deactivate microorganisms and/or to ensure the residual concentrations in drinking water distribution systems thus protecting from micro organisms re growth. Chlorine can react with naturally occurring organic substances such as humic acid and fulvic acid to form a wide variety of disinfection by- products (DBPs), many of which are known to be carcinogens (US EPA method 502.2). The main objective of this survey is to determine the Tri Halo Methane (THM) concentrations present in chlorinated water, supplied by Greater Colombo water treatment plants. Tri Halo Methanes are the major type of Disinfectant By Products (DBP's). Samples were collected regularly (7 times) from Ambathale, Labugama and Kalatuwawa over a period of 11 months. Samples were collected from 4 treatment plants at Ambathale and the pre-chlorination and post chlorination steps of Labugama & Kalatuwawa for Chemical Oxygen Demand (COD) and Total Tri Halo Methanes (TTHM) analysis. (sum of 4 compounds viz. Tri Chloromethane, Bromo Dichloromethane, Dibromo Chloromethane and Tribromo Methane)

The investigation revealed that THMs are present in the chlorinated drinking water but concentration of Total THMs are below the WHO and US EPA limits and the limits are100 μg/L and 80 μg/L respectively. COD of all samples was below 2 mg O_2/ L. Stability of the 4 compounds was also studied. Trichloro Methane (TCM) is the most unstable compound. Other three compounds change slightly and behavior is almost same. Concentrations of all four compounds decrease with time in the normal environmental conditions.

Several THM removal methods were tried for samples containing TTHM viz. Aeration, Boiling, Sonication and passing through activated carbon. They were all found to be efficient and practical methods, which can be applied for removal of THMs.

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