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NEWSLETTER

OXY-CHLORINATION OF ORGANIC EFFLUENTS

Chlorine is used extensively by industries and municipalities to disinfect their effluents, to retard bacteria growth in water distribution and cooling systems, and to meet oxygen demand standards set for receiving waters. In view of the increasing amounts and variety or organic compounds present as pollutants in water supplies and waste waters, there is a mounting awareness that there may be potential environmental hazards due to polycholorinated organic compounds generated during the chlorination.

With the support of Canada Centre for Inland Waters, Dr. Jim Smith of the Chemistry Department has been working on a project to delineate the chemistry of the chlorination insofar as phenols and aromatic hydrocarbons are concerned. A number of specific compounds from each of the two classes has been treated with dilute aqueous solutions of chlorine under conditions simulating those used in practice. The majority of the compounds examined react by a combination of oxidation and chlorination.

The product mixtures are complex and the principal effort is directed towards the isolation and identification of individual products. In a number of instances, specific polychlorinated products and/or chlorinated oxidation products have been characterized.

For example, biphenyl, a commercial dye carrier used in textile processing, reacts under these conditions producing a product containing 20-25% by weight of chlorine. Specific monochloro- and dichlorobiphenyls have been identified in this mixture. In overall composition the product resembles one of the commercial polychlorinated biphenyls (PCBs) whose sale and distribution has recently been restricted because of the environmental consequences arising through indiscriminate use. It would appear that the present occurrence of PCBs in the environment can arise from sources other than direct use of the commercial products.