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Effects of stable chlorine-containing organics on aquatic environments

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DURING 1962, approximately 60,000 tons of chlorine were added to the effluents of sewage treatment plants in the United States[1] and subsequently released to surface waters. By 1970, it was estimated that 100,000 tons of chlorine were added annually, and the quantity will continue to increase as municipalities are required[2]to provide at least secondary treatment for sewage by July 1, 1977 (ref. 3). Principal reactions of chlorine in natural waters, besides hydrolysis, are with ammonia and organic amines[4,5]. Reactive chlorine residuals, for example, hypochlorites, inorganic and organic chloramines, are characterised by reactive chlorine which would decompose or be consumed in various chemical reactions[5]. Jolley[3] has identified seventeen stable chlorine-containing organic compounds at low μg 1-1 concentrations in chlorine-treated sewage effluent. The persistent nature of these compounds, which are characterised by chemically stable or inert C−Cl bonds, suggests potential for their accumulation in receiving surface waters[6,7].

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