

Organic Compounds and Genotoxicity in Drinking Water

Until recently only lipophilic compounds were analysed in any research on the occurrence of mutagenic and carcinogenic compounds in water. They were isolated using XAD-resins. They contain approximately half of the total organic material present in water. A clear mutagenic effect was demonstrated for these compounds using Amestest.

The hydrophilic fraction of the organic material was difficult to investigate because of problems with isolation and analysis caused by its high solubility. The high solubility means in practice that the hydrophilic compounds are mobile in conventional treatment systems and in soil and can easily penetrate into drinking water.

A method was developed to isolate hydrophilic compounds using a combination of ion exchange and a clean-up with a XAD-resin. The isolated compounds were examined with the Amestest for the presence of mutagenic compounds.

For some tested water types a mutagenic effect was found in the lipophilic material. Due to oxidation with ozone, mutagenic compounds can be formed from (non-mutagenic) industrial pollutions. No mutagenic activity was found in the hydrophilic organic material of all examined water types, even after ozone oxidation or chlorination. It was hypothesized that hydrophilic compounds can not reach the DNA of the cell, thus they do not play any (geno) toxicological role.



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