

Executive Summary

Drinking water disinfection by-products (DBPs) are formed when a disinfectant reacts with natural organic matter (NOM) and/or bromide/iodide present in water. Trihalomethanes (THMs) and haloacetic acids (HAAs) are the two most prevalent classes of DBPs in chlorinated drinking water. In the UK, THMs are regulated and a maximum concentration value of $100 \mu\text{g L}^{-1}$ at a consumers' tap has been set for the sum of four THMs.

THMs are regulated because of their potential health risk, as well as acting as surrogates for the control of other halogenated DBPs of potential health concern. It has been shown that switching from chlorine to chloramines minimised the formation of THMs and HAAs but increased the concentration of certain nitrogenous DBPs, such as cyanogen halides. A recent study reported that iodinated THMs are more prevalent in samples treated with chloramines compared to chlorine when iodide is present in the source water. Although present at much lower levels than regulated DBPs, iodinated DBPs have been shown, in some assays, to be more cytotoxic and genotoxic than their chlorinated and brominated analogues.

Iodide is naturally present in drinking water sources. The levels of iodide measured in the UK have shown significant variation in the limit of detection due to different methods being used making interpretation of the data difficult. Although levels in final waters are generally thought to be low Defra are seeking to review the current data collected post 2008 and select sites for further monitoring using a sensitive method to produce a robust dataset. There is a regulatory requirement in the UK for water companies to minimise the formation of all DBPs without prejudicing the effectiveness of disinfection. The knowledge gained from this project will help inform water companies' risk assessment in relation to their source waters and the potential formation of iodinated DBPs.