

7th World Congress on

Mass Spectrometry

June 20-22, 2018 | Rome, Italy

Optimization of a GC-Atmospheric Pressure Ionization MS/MS method for the identification of disinfection by-products in drinking water

Kaatleen Van Den Steen¹, Jo Daems¹, E Borregan², R Jones³, M Van Hulle⁴ and Pieter Joos^{1,2}¹Water-link, Belgium²University of Antwerp, Belgium³Waters Corporation, UK⁴Waters NV, Belgium

Water-link is a drinking water company, located in the Antwerp region, which provides drinking water for over 2 million people in Belgium and the Netherlands. Surface water, coming from the river Meuse and transported to the catchment areas of our production sites by the Albert Canal, is purified to drinking water with a quality according to the EC regulation 98/83/EU. However, a relatively large number of companies are located alongside this channel and the possibility exists that these companies are pouring their waste water in the channel. Organic chemicals, like pesticides, industrial chemicals or pharmaceuticals are poured into the Albert Canal from which drinking water is produced. During the disinfection of the drinking water, disinfection by-products (DBPs) can be formed. Constant monitoring of the quality of drinking water is very important. Hence, a good working screening method is necessary. In the past we established such a method, based on GCxGC in combination with unit resolution mass spectrometry but we found some of the chemicals, which we detected to be categorized as 'unknown'. In case of these DBP's, the molecular ion is not present in the spectrum, so a more soft ionization technique should be used: atmospheric pressure ionization mass spectrometry (GC-API MS). We did some test with APGC combined with Triple Quad and with high resolution mass spectrometry. Several drinking waters samples were injected on both systems for the determination of DBP's. The results and conclusions of this research will be presented.

Kaatleen.VanDenSteen@water-link.be

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