

## Fluorescence based monitoring tool for disinfection byproducts in drinking water

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Drinking waters around the world are produced from raw water sources, mainly surface waters from lakes, streams and rivers containing different pollutants and microorganisms like bacteria, virus and parasites. In order to make natural water drinkable it should be properly treated to remove these harmful substances from water and disinfected in order to make drinking water free of any disease causing microorganisms. Once the water has been through various treatment process, the last stage is to add a very small amount of chlorine (common in Sweden) or other disinfectant to it, to kill the bacteria, virus and parasites that may remain in the water. This also prevents any regrowth and reoccurrence of bacteria, virus or parasites during distribution to the consumers and ensure safe drinking water quality. However, if there are unremoved organic pollutants in water, some toxic and carcinogenic by products are formed during disinfection.

So how these by products formation can be stopped or reduced? Should we take the risk by reducing the dosage of disinfectant which may increase risk of water-borne diseases?

World health organization (WHO) has set a strict rule to not compromise disinfectant dosage in an attempt to control disinfection by products. Thus there needs to be a trade-off between the risk associated with microorganisms present in drinking water and the chronic risk linked to disinfection by products. For this reason, it is important to monitor the disinfection by products formed during water treatment processes and to minimize their formation by proper design and operation of water treatment processes.

Unfortunately, measurement and monitoring of disinfection by products requires expensive instruments, complicated pre-treatment of sample solutions as well as experienced lab personal which is not always available to the drinking water producers. Alternative methods are desired that are simple, cheap and measure disinfection by products accurately. In an attempt to measure, disinfection by product in a simple manner, we are developing a method that converts all the disinfection by products within a sample into a colorful solution. A light source will be used to illuminate this colorful solution, which then absorbs part of the light and reflect some part of the absorbed light onto a detector. By measuring the reflected light and correlating it to the actual concentration of disinfection by product, we can monitor disinfection by product in any solution.

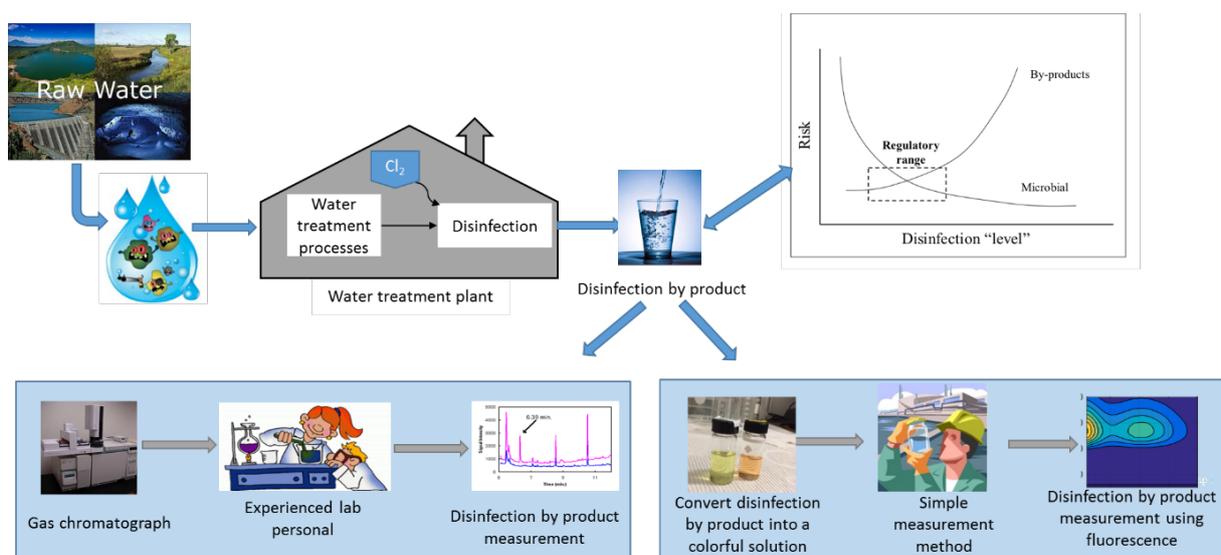


Figure 1 Fluorescence based monitoring tool for disinfection by products in drinking water