Can we get more about what happens inside the black-box of disinfection process in drinking water?

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Have you ever thought about what is the most important factor about the quality of the water you drink? Should you be more concerned about the dangerous bacteria or the harmful chemicals in water? According to world health organization, improving the microbial quality is the primary goal for the water suppliers to assure there is not any health risk for the consumers. To achieve that, there are different treatment processes removing or inactivating the dangerous bacteria at different stages of water treatment. Among them, ultraviolet light (UV) is considered to be an efficient disinfection method which damages the DNA of bacteria and viruses destroying their ability to multiply and causes the diseases.

Different microorganisms are sensitive to the UV light at different levels. The adequate amount of UV light which should be applied is determined using laboratory analysis and then is recommended to water suppliers. The UV treatment takes place inside the chambers in which lamps are installed and water passes through for a few seconds. After implementing the UV treatment, it is not possible to evaluate whether the UV exposure is performing efficiently or not since the methods for enumerating the microorganisms is difficult and time consuming, therefore, it is not possible to be done at the treatment plant. The only way to evaluate the process is to monitor the amount of light using the sensors installed inside the chamber. But, to assure that the values given by these sensors represent the real amount of light received by the water we should have one additional measurement tool.

We need to know what else is happening inside the UV chamber upon the UV irradiation. Is it only the microorganisms damaged by UV light or do the other content inside the water get effected too? Being able to measure the impact of UV light on another parameter of the water which is not as difficult as enumerating the microorganisms can help us to estimate how much of UV light caused that affect. In this study, we developed a fast and sensitive method which give us the chance to estimate the amount of UV light received by water using the organic matter content of water.

Forskning och innovation för säkert dricksvatten

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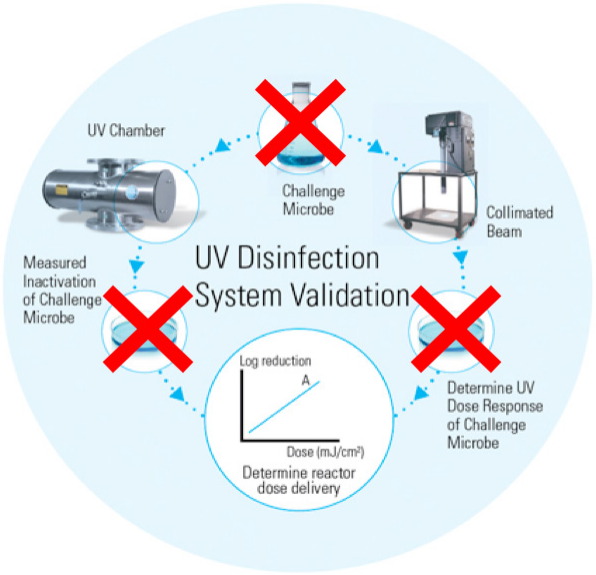

In order to avoid the time consuming microbial analysis:

UV irradiation

We analyse the organic matter content of water.