

Fluorescent residual following UV disinfection of drinking water.

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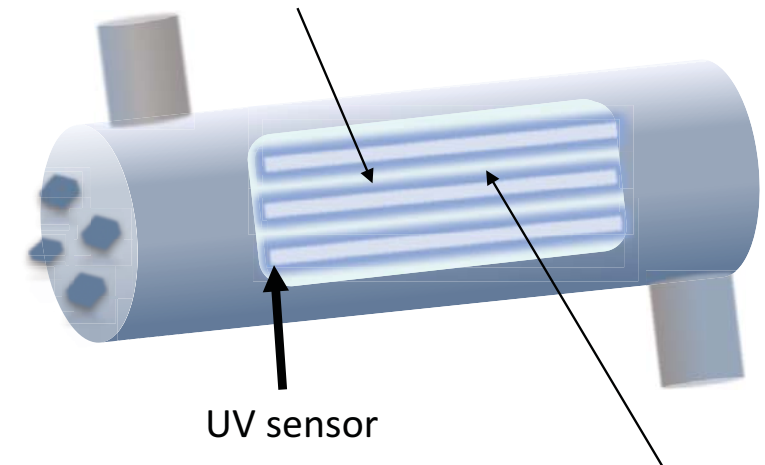
DRICKS, Chalmers University

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- Ultraviolet (UV) disinfection:
 - Inactivation of resistance microorganism to chlorination.
 - Decreasing the dose of chemical disinfectant.

- Performance of UV disinfection depends on:
 - Characteristic of the water.
 - The dose of irradiated UV light.

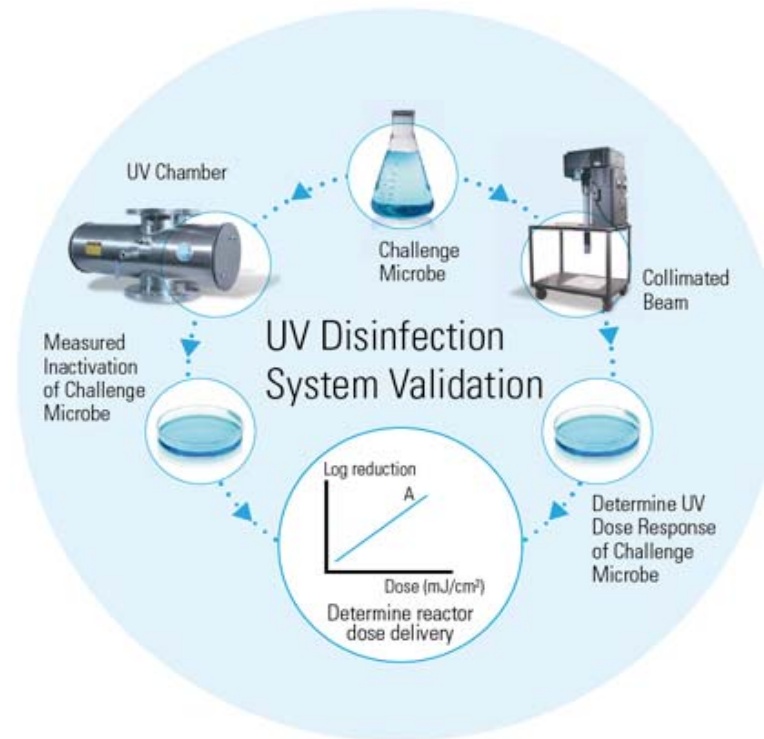
- Unlike chlor(amin)ation, there is no chemical residual to assess the effectiveness of UV disinfection.
- Measuring the UV dose using UV sensor inside the UV chamber:
 - It is not homogenous within the chamber.
 - It needs to be calibrated and regular maintenance.



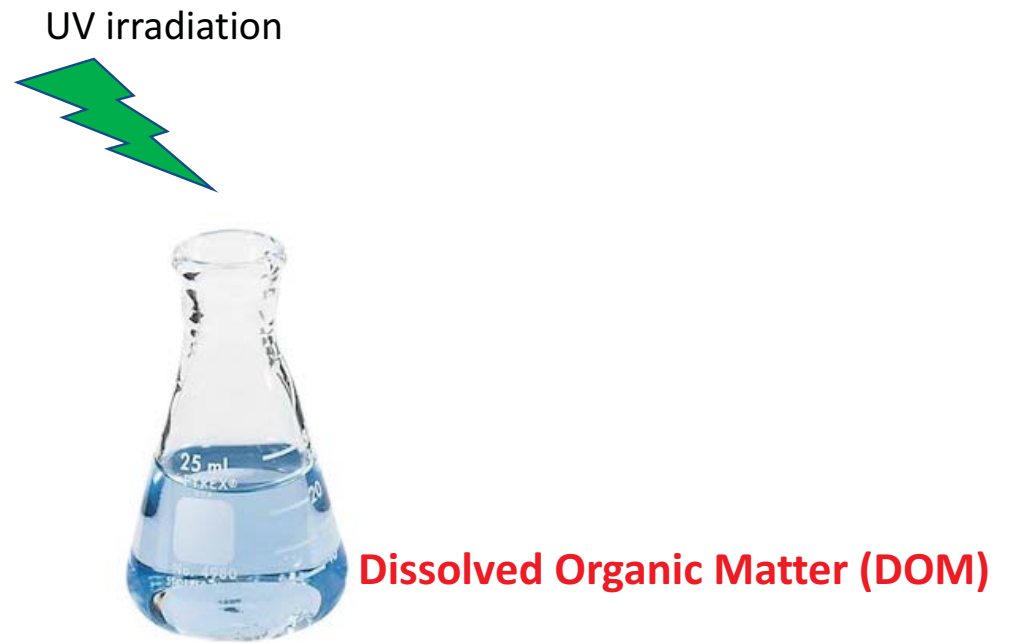
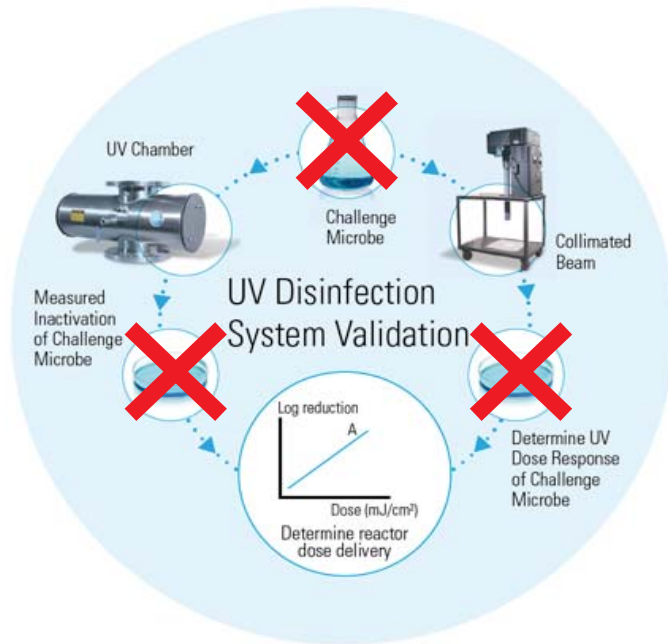
Validation method

- How validate the dose for inactivation of target microorganism:

Biodosimetry



- Expensive
- Time consuming
- The system should be off-line.



Does UV disinfection
change fluorescence
at treatment plant?



What is the
relationship between
fluorescence and UV
dose?



Is it predictable?

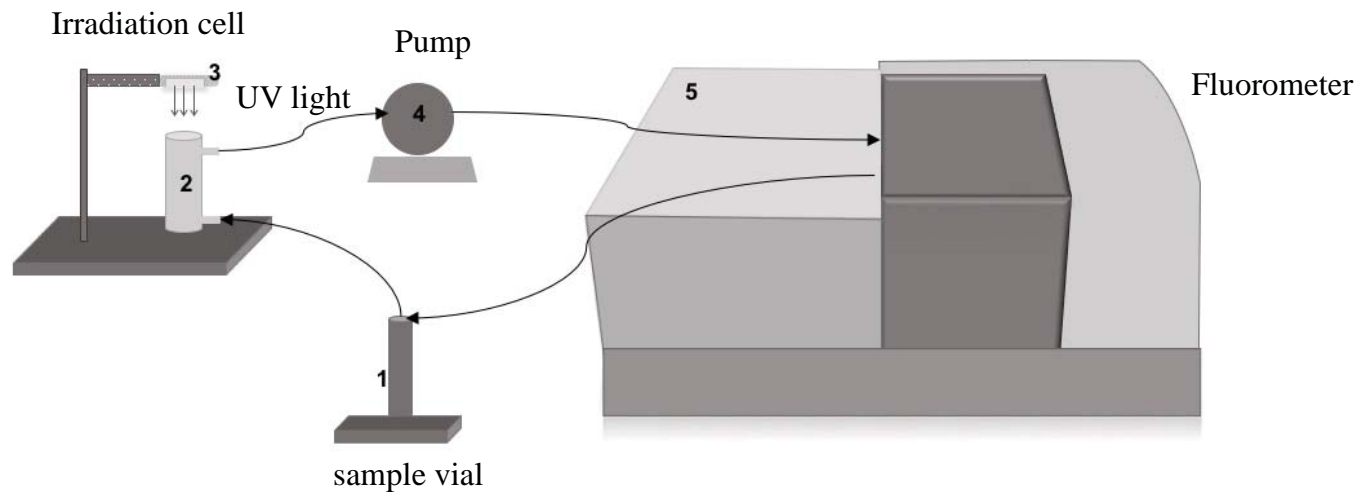
- At treatment plant

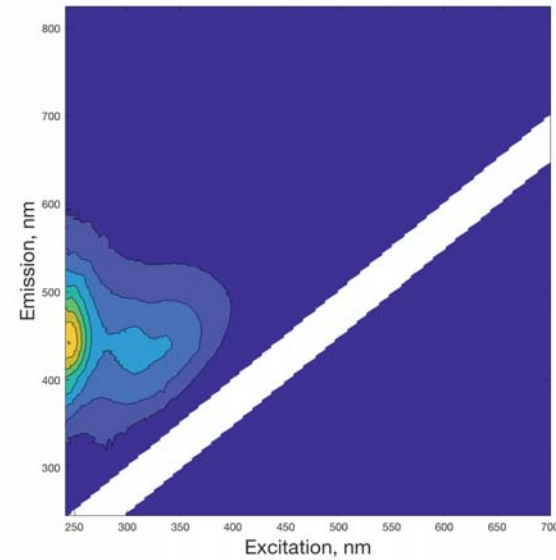
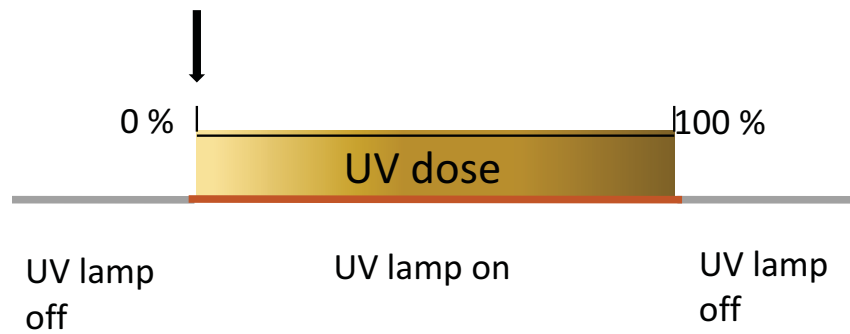


Fluorescence measurement at laboratory

- In laboratory

- Water samples collected before the UV disinfection from WTPs (e.g. Mölndal).
- Irradiation and measurement happened simultaneously.





Changes in fluorescence EEMs during UV irradiation

- UV_{254} disinfection causes detectable changes in fluorescence signal.
- DOM fluorescence is a potential proxy of the applied UV dose during drinking water disinfection.
- The reproducibility of the results have been examined using difference water samples.