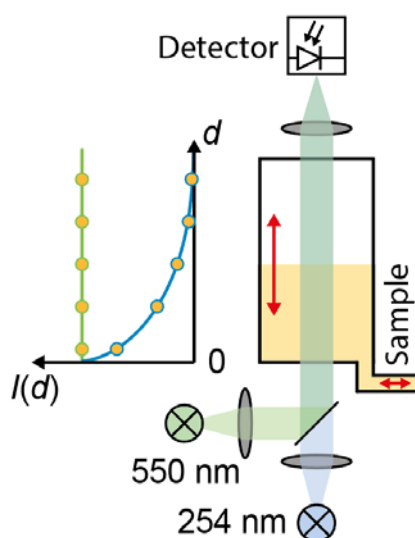


## SAC(254) – Dynamic Absorption Measurement Improves Accuracy and Reliability under Challenging Measurement Conditions

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The spectral absorption coefficient at 254 nm, SAC(254), is a versatile water quality parameter, which can be used as surrogate for carbon-based parameters as *DOC* or *TOC*, which are less conveniently measured continuously. SAC(254) is suited for monitoring and optimizing water purification processes, which remove (coagulation/flocculation, activated carbon adsorption) or chemically alter (ozonation, advanced oxidation processes) the organic content of water. Modern control strategies for these processes rely on the instantaneous, accurate monitoring of process efficiency, which makes high demands on UV absorption monitors, that can only be met by putting significant efforts into cleaning and maintenance.



$$I(d) = I(0) \cdot 10^{-\text{SAC}(254) \cdot d}$$

*Figure 1: Principle of dynamic absorption measurement. Evaluation of the exponential decay as a function of the fill level yields the spectral absorption coefficient. The result is independent of the initial intensity  $I(0)$ , which comprises intensity losses caused by fouling and soiling of the optical window and all other potential long-term drifts of the light source and the instrument.*

Dynamic measurement of SAC(254) guarantees accurate results at any time by eliminating issues of conventional UV absorption monitors, which are related to instrument stability: The technique is insensitive to fouling and soiling of the optical

components inside the flow-through photometer as well as any potential long-term drifts of the instrument itself and does not require regular manual zero-calibrations.

The results of long-term tests with surface water at a water purification plant and wastewater, which was treated for micropollutant removal, will be presented. The data prove the superior stability of dynamic SAC(254) measurement even under challenging conditions, such as biologically active water causing severe biofilm formation. No drift of measurement results was observed at any time as it is required for reliable process control.