Ontwikkeling van Nieuwe Afvalwater-Zuiveringstechnologieën bij WUR

Norbert Kuipers, Wageningen Food & Biobased Research (WFBR, part of the WUR)

To increase the Potential of Water to improve the Quality of Life

"PRAKTIJKCASES BEHANDELING INDUSTRIEEL AFVALWATER"

Stichting Kennisuitwisseling Industriële Watertechnologie (SKIW)

1 november 2023 in Zutphen

Programme: Circular Water Technologies (Irma Steemers)

Accelerate the transition to a circular and biobased economy by *closing the water & nutrients loop*, *preventing aquatic pollution* and *introducing biobased & energy efficient technologies*

- Water of fitting quality
- Sufficient availability of (fresh) water
- Prevent water pollution and recover valuable compounds
- Decrease the carbon footprint of water use

Propositions

I. Water Treatment for Circularity
II. Water Technology for Energy Production
III. Biobased Products for Water Treatment

WAGENINGEN
UNIVERSITY & RESEARCH

Microbiological Safety & Elimination of Toxic Substances

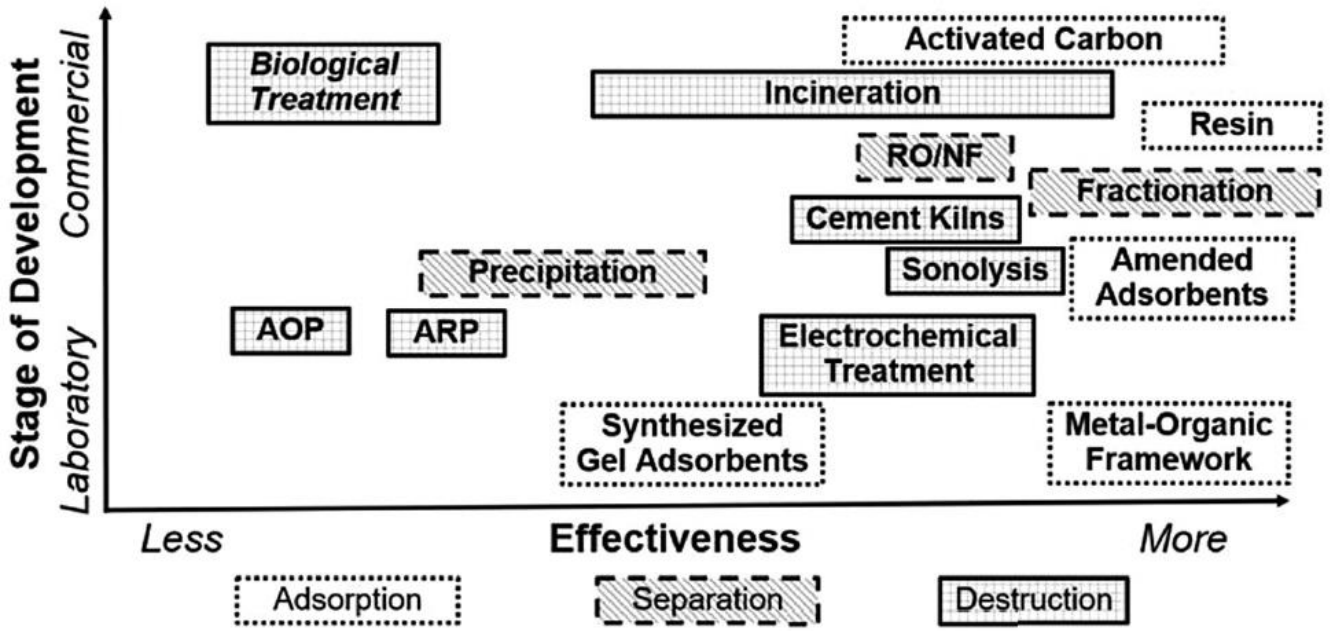
PFAS: Microbial Conversion & Separation/Destruction (running, idea)

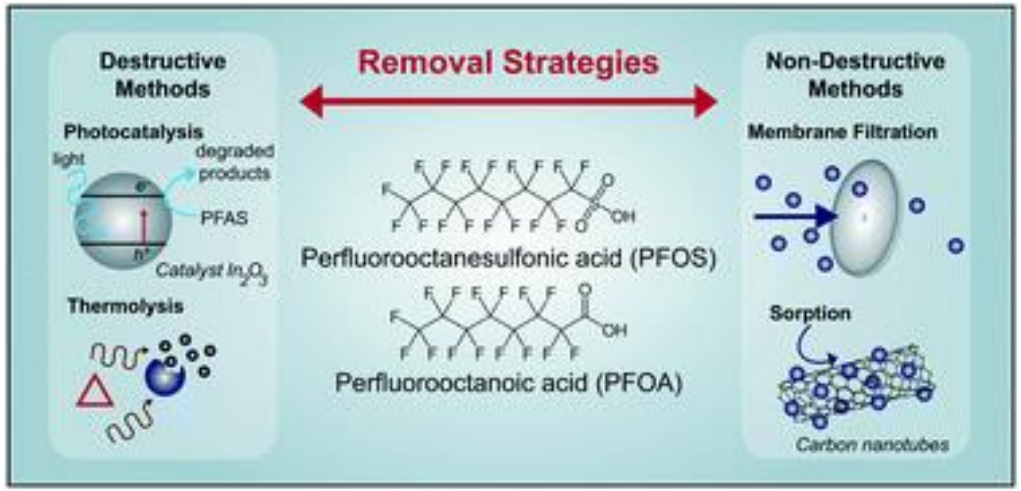
Approach (average concentration: 325 ng/L)

- *Microbial conversion of PFAS*
- *Adsorption, (electro)membrane treatment, or AOP*
- *New detection method for sensor development*

Contribution

- *Prevent contamination of drinking water sources*
- *Decentralized water treatment*



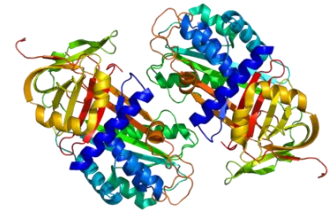


WAGENINGEN
UNIVERSITY & RESEARCH

PFAS: New Detection Method for Sensor Development (idea)

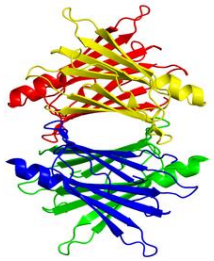
Approach

- *High-throughput well-plate assay: detect effect of class of chemicals (structural information is not needed !)*



TBG

Albumin



TTR

Background

- *Detection of 3 blood proteins (transporting thyroid hormones T3 & T4)*
- *PFAS molecules compete with T3/T4 for binding to these proteins*

Test format

- *Printing array of TBG, TTR and ALB spots in wells of microtiter plate*
- *Adding fixed amount of labelled PFAS molecule together with sample*
- *If PFAS molecules are present in sample: competition with labelled compound for binding to proteins; to a various extent per protein*
- *Signal profiles will reveal whether PFAS molecules are present*

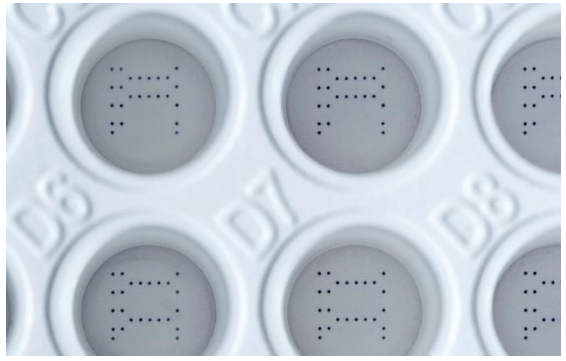


Plate Image Reader

WAGENINGEN UNIVERSITY & RESEARCH

Thank you for your attention!

Expertise: Separation & Purification
norbert.kuipers@wur.nl

Program Circular Water Technologies
irma.steemers-rijkse@wur.nl

WAGENINGEN
UNIVERSITY & RESEARCH

To explore the potential of nature to improve the quality of life