



Pharmaceutical and Personal Care Products are polluting our drinking water resources

Eliminating Contaminants from Pharmaceutical and Personal Care Products

Emerging organic contamination in drinking water system is a challenge for the whole world. Through consumption and disposal of Pharmaceutical and Personal Care Products (PCCPs), organic contaminants inside these products, which are mostly colorless and odorless chemicals, can easily migrate into our drinking water resources and bring serious health problems.

Pharmaceutical and Personal Care Products (PCCPs), is a large emerging family of synthetic chemicals widely used by individuals for personal health or cosmetic reasons. Thousands of these chemicals including antibiotics, hormones, cosmetics, fragrances have gained significant concerns for their persistent input and potential threat to the ecosystem.[1,2] Even worse, they are threatening the public drinking water supply due to the toxicity and bioaccumulation potential.[3] However, the public is usually unaware of these dangerous chemicals hidden in their daily living products such as caffeine (in coffee, tea), triclosan (in antibacterial soap) and ibuprofen (anti-inflammatory drug). During this project, you will be involved in the following activities for a thoughtful review about the impact of PCCPs on water systems.

- Investigation of potential household products with PCCPs in the market.
- Survey of the public's knowledge about PCCP issue for drinking water.
- Exploring policies for monitoring and regulating commercial PCCPs.
- Discussion about novel material technologies for PCCP removal (i.e., graphene-related 2D materials) with some demo experiments.

Literature recommendation:

1. Borg, D., and Ivarsson, J. "Analysis of PFASs and TOF in products." TemaNord (2017):543 <https://norden.diva-portal.org/smash/get/diva2:1118439/FULLTEXT01.pdf>
2. Emerging chemical risks in Europe — 'PFAS' <https://www.eea.europa.eu/publications/emerging-chemical-risks-in-europe>
3. M. Zambianchi, Z. Y. Xia, et al., "Graphene oxide-polysulfone hollow fibers membranes with synergic ultrafiltration and adsorption for enhanced drinking water treatment", Journal of Membrane Science, 2022, 658, 120707

Target group of students
IMS material engineering

Group size
4-6

Special requirements
Basic knowledge in materials science and engineering; background in chemistry and nanotechnology are meriting.

Suggestion from
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Can the project be duplicated?
No