

Nanofiltration for removing toxicity of industrial waste waters

Sébastien Déon

Université de Bourgogne Franche-Comté, France

Nowadays, the recycling of wastewaters is an overriding challenge since population becomes aware of health and environmental issues due to industrial pollution. Therefore, industries have to develop innovative processes to minimize the amount of toxic substances in their discharges. Within this context, pressure-driven membranes appear to be a potential alternative to remove micro-pollutants from aqueous solutions. In this study, the possibility of implementing a nanofiltration step to remove toxicity was firstly investigated on synthetic solutions containing metal ions at various concentrations (with or without salinity). Afterwards a real discharge water from a French surface treatment industry was filtrated in high permeate recovery mode and performances were investigated over filtration time. All these experiments have demonstrated that metal rejections are higher than 90% irrespective of the solution investigated. The impact of this NF step on living organisms was also examined before and after treatment on both hatching of snail eggs and mobility inhibition of an aquatic crustacean. These eco-toxicological tests have shown that solutions containing only metallic ions have almost fully lost their toxicity after nanofiltration, whereas a non-negligible detrimental impact on snail egg hatching was found with the discharge water. It is worth noting that, contrary to snail egg hatching, crustacean mobility was found to be unaltered by the treated effluent and the choice of the bioassay has proven to be a core issue for such studies.

Biography

Sébastien Déon obtained his PhD degree from the University of South Brittany in 2007 on the modeling of transport through nanofiltration membranes. In 2008, he became Assistant Professor at the University of Franche-Comté where he has broadened his areas of expertise to electrokinetic characterizations of membrane materials and fouling cakes. Currently, he is Associate Professor and his skills are mainly dedicated to water treatment by membrane processes. He is also the Author or Co-author of one book, 24 publications in international recognized journals, and twenty presentations in international conferences. His expertise in reviewing scientific papers led him to become an Associate Editor of *International Journal of Membrane Science & Technology* and an Editorial Board Member of several peer-reviewed journals such as *International Journal of Chemical Engineering*.

sebastien.deon@univ-fcomte.fr**Notes:**