25 June 2021 (Friday)

4.00pm-5.30pm (SGT) (GMT +8)
Session 2.4 – Expanding Ceramic Membrane Applications

Session Chair(s): Jonathan Lim, Binnies SIngapore (Singapore)

Long-Term Operation Experience Of Ceramic Membrane Microfilter Plant

YI. Song, Clean Water Supply Facilities Maintenance Department, K-water (South Korea)
Presenter is an invited speaker. No executive summary is available

Upgrading Of Choa Chu Kang Waterworks With Ozonated Ceramic Microfiltration

V. Lam, H. Shorney-Darby, M. Mun, Y. Wang. PWNT (Singapore)

This paper provides an overview of planning and implementation of 180 Mld of ceramic microfiltration (CeraMac® by PWNT) at Choa Chu Kang Waterworks (CCKWW) in Singapore. CCKWW is the largest full-scale ceramic microfiltration water plant in the world. The technical approach, initial performance and the lessons learned will be discussed, and the paper will include recommendations for future projects. The focus is on providing a roadmap on how new innovative technologies can be evaluated and implemented at water utilities.

Flux Enhancement Of Ceramic Membrane Filtration By Coagulation And Ozonation Pretreatment For WWTP Effluent Reuse

M. Spruijt, B. Martijn, M. Hoekstra, J. Kruithof. PWNT (The Netherlands)

In a joint research effort, PWN Water Supply Company North-Holland (PWN), PWN Technologies (PWNT) and Water Authority Hollands Noorderkwartier (HHNK) investigated the feasibility of ozonation for pharmaceutical control and flux enhancement of Ceramic Membrane Filtration (CMF). A bench-scale equipment was developed to conduct ozone experiments for pharmaceutical control while a pilot plant was developed to study flux enhancement of CMF. For an ozone dose of 7 mg/L, most pharmaceuticals were degraded for more than 99%. By applying this ozone dose of 7 mg/L, the CMF flux was enhanced by 100% compared to the flux achieved for untreated WWTP effluent. Because of these very positive results, the O3/CMF concept will be tested full-scale in a demonstration plant.

Chemical-grafting of Graphene Oxide Quantum Dots (GOQDs) onto Microfiltration Ceramic Membranes (CMs) for Anti-organic Fouling Potential

Q. Gu, T. Ng, I. Zain, X. Liu, L. Zhang, Z. Zhang, Z. Lyu, Z. He, HY. Ng, J. Wang. National University of Singapore (Singapore)

Surface modification of ceramic membranes is an effective pathway to improve their fouling resistance. In this work, graphene oxide quantum dots (GOQDs) were prepared and then immobilized onto the (3-aminopropyl) triethoxysilane (APTES) functionalized alumina membrane surface by covalent bonding. The ceramic membranes modified by GOQDs remain a porous structure with reduced surface roughness and improved hydrophilicity. As a result, the GOQDs modified ceramic membranes show improved fouling resistance in HA solution under submerged conditions.