

Functional Gels and Coatings for a Sustainable Water Environment

Wei Han^{a,*}, Joseph Kai Cho Kwan^a, King Lun Yeung^{a,b}

^{a)} *Division of Environment and Sustainability, The Hong Kong University of Science and Technology*

^{b)} *Department of Chemical and Biological Engineering, The Hong Kong University of Science and Technology*

Water safety directly impacts public health and human well-being. Eutrophication and microbial pollution in water bodies, largely driven by human activities, not only impose significant energy demands during remediation and transportation but also severely threaten aquatic ecosystems, thereby hindering a sustainable future. To address these challenges, our interdisciplinary team from The Hong Kong University of Science and Technology (HKUST) has developed innovative materials-based solutions.

This talk will showcase how our team designed and fabricated functional gels and coatings, manipulated their physiochemical properties, optimized device construction and system integration, and translated them into practical applications. The speaker will highlight the R&D process, technology translation pathways, and societal impact of these innovations, focusing specifically on phosphate-adsorbing aerogels, controlled-release hydrogels, and anti-fouling pipe coatings.

Corresponding author: keweihan@ust.hk