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Abstract

An automatic demulsification sponge for separation of oil/water emulsion

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Abstract:
The oil droplets contained in wastewater often caused considerable troubles in wastewater treatment. Especially for the oil-water emulsions containing oil droplets with small particle size. The engineers and the researchers are always pursuing advanced materials and technology to deal with them.

Recently, a polymer with a quaternary amine structure was synthesized in our laboratory. We have applied such polymer to sterilization and separation of oil-water emulsions and achieved good results.

When such a monomer is specifically polymerized in sponges having particular pore structure, the emulsion-containing wastewater was separated perfectly (efficiency > 99%). Besides, these sponges exhibited a surprising automatic demulsification effect in just a few minutes. The application of the basic principles of electrostatic adsorption, concentration diffusion, aggregation, and density convection are used to explain the mechanism of the automatic demulsification effect. We believed that the discovery of this phenomenon will help the academic and engineering communities to develop more efficient automatic demulsification sponges in the near future.

Biography:
Dr. Ping-Szu Tsai currently is a Professor of the Department of Chemical and Materials Engineering. He received his B.S. degree in chemical engineering from National Taiwan University of Science and Technology, Master degree in college of Pharmacy from Kaoshiung Medical University and Ph.D. degree in chemical engineering from National Cheng Kung University. Dr. Tsai joined National Kaoshiung University of Science and Technology in 1992. Dr. Tsai's current research interests

include oil/water separation technology, organic/inorganic Nano hybrids, regeneration bitumen, emulsified bitumen/diesel, transparent/super hydrophobic coating and synthesize of functional polymers.

Publication of speakers:

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