



Ultrasound membrane hybrid processes for dairy wastewater treatment

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Novel wastewater treatment is necessary to effectively decrease the organic load of dairy wastewater before disposal. In this work the feasibility of hybrid processes of ultrafiltration combined physical processes, like ultrasound or microfiltration for organic load decreasing was investigated. The efficiency of the advanced hybrid processes that apply ultrasonic irradiation or microfiltration as pretreatment processes followed by pressure-driven membrane ultrafiltration was tested. Fluxes, relative fluxes, membrane conductivity, turbidity and chemical oxygen demand rejections and membrane, gel-layer and inner porous fouling resistances were analyzed and compared in single and combined processes. Furthermore, to understand the fouling mechanisms in depth, the influence of the membrane fouling on the contact angle results was also investigated.

Keywords: Dairy wastewater; Pretreatment; Ultrasound; Ultrafiltration (UF); Hybrid processes; Membrane fouling, Contact angle

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A liquid desiccant dehumidification and regeneration process to meet cooling and fresh water needs of desert greenhouses

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Agriculture accounts for 70% of freshwater usage worldwide. Desalination cannot meet the growing needs for irrigation and food production unless water saving measures are also implemented. This problem is particularly acute in hot, desert environments such as Saudi Arabia. Cultivation in greenhouses uses just a fraction of open field cultivation, but would-be producers face three main challenges: fresh water supply, plant nutrient supply and temperature control (cooling) of the greenhouse. Cooling and water supply often go hand in hand; the common practice of evaporative