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Closing the cycle: phosphorus removal and recovery from diluted effluents using acid resistive membranes

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Abstract

New regulations in many developed countries call for a significant reduction in phosphorus concentration for effluents released to the environment. At the same time, recovery of phosphorus - a non-renewable resource used mainly as fertilizer - from anthropogenic waste is extensively studied and bolstered as a crucial component in maintaining future food security. Thus far studies on phosphorus recovery mainly focused on concentrated streams, although diluted effluents such as treated wastewater often contain a significant portion of the phosphorus mass. Here we propose a new approach for the simultaneous removal and recovery of phosphorus from diluted effluents using a membrane characterized by high phosphate rejection and acid resistance. High P rejection allows for the concentration of phosphorus in the retentate until recoverable calcium-phosphate precipitants are formed, while acid resistance

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