

CONCENTRATION OF SHRIMP WASTEWATER BY ULTRAFILTRATION FOR PROTEIN RECOVERY

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Food industries are responsible for much of the industrial organic pollution found in the world. Among them, the fish industry rejects several wastewaters, mainly from washing, defrosting and cooking, which contain certain levels of proteins. In this context, ultrafiltration can be suggested as an alternative process to recovery and concentrate these proteins, which can be used even for animal feed formulations or for human consumption. The objective of this work was to study the concentration of shrimp wastewater by ultrafiltration at three different temperatures (25, 35 and 45°C). Ultrafiltration was performed with 2L of effluent (with an initial protein concentration of 0.85±0.05 g/ml), at ceramic tubular membranes with effective permeation area of 0.022 m². The processes were evaluated in terms of permeate flux and volumetric concentration factor. The feed and the concentrated wastewater were characterized for their electrophoretic profiles and were analyzed for their protein content. As results, the permeate flux varied from 170 to 60 kg/h.m², approximately, considerably decreasing along time due to factors like concentration polarization and fouling. In general, the permeate flux increased with the increase of temperature, which is related to the decrease on viscosity, which favors mass transfer during processing. The volumetric concentration factors achieved in the processes performed at 25, 35 and 45°C were 1.90, 2.05 and 2.08, respectively. Similarly, proteins were concentrated almost two times, reaching values around 1.70 g/ml in all the tests. The electrophoretic profile of the feed and of the retentate confirmed the proteins concentration. Ultrafiltration showed to be an adequate process for concentration of shrimp wastewater proteins. Once the processing times were short and the permeate flux were high, new tests were purposed, with larger volumes of effluents.

Keywords: membrane process, shrimp wastewater, protein concentration.