

Abstract:

Ultrafiltration is an interesting technique that is widely used to valorize whey proteins. However, it is limited by membrane fouling. Whey clarification and the operation in appropriate conditions attenuate this undesirable phenomenon. In order to improve ultrafiltration efficiency, a clarification processing was performed followed by ultrafiltration and diafiltration. The chemical composition of clarified whey and UF/DF retentate and permeate was studied. The tangential ultrafiltration of clarified camembert whey was realized with a 30 kDa polyethersulfone membrane. Its hydraulic intrinsic resistance and permeability were $1,104 \cdot 10^{12} \text{ m}^{-1}$ and $326,3 \text{ L/h}\cdot\text{m}^2$, respectively, at 1 bar PTM. Whey was adjusted to pH 5, 6.2 and 7.3 and ultrafiltration was carried out to elicit the effect of pH on permeate fluxes and protein retention. At pH 6.2 and 7.3, permeate fluxes ranged from 50.40 to 39.36 $\text{L/h}\cdot\text{m}^2$ and from 55.2 to 33.96 $\text{L/h}\cdot\text{m}^2$, respectively. On the other hand, around the isoelectric point of major proteins, at pH 5, permeate fluxes varied from 38.4 $\text{L/m}^2\text{h}$ to 25.58 $\text{L/m}^2\text{h}$. For protein retention at CF 3, the best result of 96.2% was obtained at pH 5. Diafiltration performed on protein concentrates allowed the complete removal of lactose and minerals.