

Effects of operating conditions on solution flux and lactate rejection in nanofiltration

김현한, 장용근*
한국과학기술원
(ychang@kaist.ac.kr*)

Under various operating pressures (100 ~ 400 psig.), the effects of lactate concentration (0.5 ~ 2.0 mol/L), flow rate (1.0 ~ 2.5 L/min), temperature (20 ~ 35 °C), and pH (5.0 ~ 8.0) on the solution flux and lactate rejection were investigated with model ammonium lactate solutions simulating fermentation broth. NTR-729HF membrane was selected since it showed a low rejection to monovalent anions such as lactate, and a high rejection to divalent anions and nonpolar molecules. In all experiments, the solution flux and the lactate recovery rate were observed to be proportional to the operating pressure. The lactate rejection also increased with the operating pressure lowering the recovery yield of lactate. Both of the solution flux and lactate rejection decreased with the lactate concentration, while the lactate recovery rate increased. The solution flux and lactate rejection were not practically influenced by the flow rate. The solution flux and the lactate recovery rate increased with the temperature and pH, while the lactate rejection decreased enhancing the recovery yield of lactate.