Electro-ultrafiltration of industrial enzyme solutions

To reduce the problems with fouling and concentration polarization during crossflow ultrafiltration of industrial enzyme solutions an electric field is applied across the membrane. The filtration performance during electro-ultrafiltration (EUF) has been tested with several enzymes. Results show that EUF is an effective method to filter high concentrated solutions at low crossflow. The flux improved 3-7 times for enzymes with a significant surface charge at an electric field strength of 1600V/m compared to conventional UF. The greatest improvement is observed at high concentration. Not all enzymes can be filtered with EUF, mainly due to a low surface charge and impurities in the feed solution. Using a pulsed electric field did not improve the flux compared to a constant field. Gel electrophoresis experiments of the enzymes appear to be a useful method for estimating the influence of the electric field.

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