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Separation and concentration of protein and microgel dispersions
RAFAEL ROA, GERHARD NAEGELE, Forschungszentrum Juelich — Membrane ultrafiltration is a pressure driven process where Brownian particles, such as small colloids or nanoparticles, are concentrated. This process is of high importance for the separation and enrichment of protein and microgel dispersions, where convective-diffusive particle transport determines the permeate flux. The efficiency of the separation process is thus strongly dependent on particle hydrodynamic structure and boundary conditions, membrane properties, and particle interactions. We calculate the concentration polarization layer and the permeate flux at different operating conditions for cross-flow ultrafiltration of BSA proteins and for ionic and non-ionic microgels. We show that the proper specification of the concentration dependent dispersion transport properties and the inclusion of microgel permeability have a significant effect on the filtration behavior on concentrated systems.

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