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Dynamics and filtration of microgel suspensions GERHARD NAEGELE, RAFAEL ROA, JONAS RIEST, Institute of Complex Systems, ICS-3, Forschungszentrum Juelich GmbH, 52425 Juelich, Germany — Microgel suspensions exhibit interesting transport properties determined by direct and hydrodynamic interactions. Using an annulus model to account for solvent permeability, we calculate the diffusion function and sedimentation coefficient of PNiPAM microgel suspensions, in excellent agreement with experimental results [1]. Moreover, an extension of our precise analytic methods to long-time properties including viscosity and self-diffusion coefficient is presented, with results compared to simulation and experimental data. The predicted transport properties are an important ingredient to the modeling of convective-diffusive transport in membrane ultrafiltration of permeable particles. The efficiency of the separation process depends on hydrodynamic boundary conditions, membrane properties and particle interactions. We calculate the concentration polarization layer and permeate flux at different operating conditions for cross-flow ultrafiltration of non-ionic [2] and ionic [3] microgels. Small microgel permeability already affects the filtration significantly [2].

1. J. Riest, T. Eckert, W. Richtering, G. Nägele, *Soft Matter* **11**, 2821 (2015)
2. R. Roa, E.K. Zholkovskiy, G. Nägele, *Soft Matter* **11**, 4016 (2015)
3. R. Roa, J. Riest, G. Nägele *et al.*, *to be submitted* (2015)

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