Abstract Submitted
for the EGLSF21 Meeting of
The American Physical Society

Finding the True Molecular Weight of Polymeric Microgels of Varying Crosslinking Density[1] PATRICK HERRON, ANDREW SCHERER, SAMANTHA TIETJEN, KIRIL STRELETZKY, Cleveland State University — Microgels are spherical particles comprised from crosslinked polymer chains suspended in solution. Due to the properties of the parent polymer, microgels undergo temperature dependent de-swelling and have a potential use in drug delivery. These microgels are synthesized using hydroxypropyl cellulose (HPC) and divinyl sulfone (DVS) cross-linker, as well as dodecyltrimethylammonium bromide (DTAB) surfactant to promote particle monodispersity. Static light scattering (SLS) was used to determine the molecular weight, Mw, the radius of gyration, Rg, and second virial coefficient, A2, of synthesized microgels at varying cross-linker density. However, absolute SLS measurements require determination of the specific refractive index increment (dn/dc), the change in index of refraction with concentration for the samples of interest. This project focused on dn/dc measurement for samples with DVS:HPC concentrations of 0.5-41. The dn/dc values found show a temperature dependence at higher DVS concentrations. Here we present how measured dn/dc values affect the obtained Mw of the microgels and show the importance of in lab testing of dn/dc values to dependably obtain thermodynamic information of microgels.

[1]Thank you to Cleveland State University's Undergraduate Research Award program for support

Patrick Herron
Cleveland State University

Date submitted: 30 Oct 2021 Electronic form version 1.4