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**Wet-Sample Electron Microscopy and Dynamic Light Scattering on Microgels Particles.**<sup>1</sup> CHRISTIAN GUNDER, PETRU FODOR, KIRIL STRELETZKY, Cleveland State University — Scanning electron microscopy and dynamic light scattering are employed to study the behavior of thermoresponsive polymer microgel systems, with a reversible shrinking-phase transition above 40.5(the low critical solution temperature), under dynamic temperature conditions. In order to enable the direct imaging of the microgels in solution, a wet-sample electron microscopy methodology is developed, in which the sample is sealed behind a thin SiN window that isolates the liquid sample from the electron column vacuum. Thus the dynamics of individual microgel particles under changing temperature conditions can be imaged with the high spatial resolution afforded by scanning electron microscopy. Correlation of these measurements with the results from dynamic light scattering on microgel solutions provides unique insights into the complex behavior of these systems, which are relevant for applications in drug delivery and bio-sensing. Moreover, the development of the wet-sample electron imaging methods is relevant for other soft matter systems that are challenging to image using electron microscopy.

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