Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Influence of temperature on the drainage of thermoresponsive polymer thin film ADRIEN BUSSONNIERE, MATTHEW JACKMAN, HIN LONG LEUNG, BO LIU, QINGXIA LIU, PEICHUN AMY TSAI, Univ of Alberta
— Due to their switchable stability under external excitation, responsive aqueous foams have recently raised interests in various applications, such as washing, cleaning and mineral recovery, where stable foam and controlled destabilization are required. In this work, we investigate the influence of the temperature and polymer concentration on gravitational thin film drainage using a thermoresponsive polymer. The dynamics of film thinning was recorded on the thin film using a thickness measurement method. We successively illuminate the film with three LEDs of different wavelengths. The absolute thickness was accurately deduced using the three interference patterns. The results show an increase of drainage rates with increasing temperature but insignificant influence of polymer concentration (in the range between 50 and 300 mg/L). The thinning process was twice faster above the LCST (lower critical solution temperature) than that at room temperature. Our results of the temperate-dependent drainage show that the thermoresponsive solubility of polymer plays a key role in thin film stability.

Adrien Bussonniere
Univ of Alberta

Date submitted: 29 Jul 2016 Electronic form version 1.4