THERMOPORESIS OF MICROMETER-SIZED POLY(N-ISOPROPYLACRYLAMIDE) MICROGEL PARTICLES

KEVIN APTOWICZ, West Chester University, TIM STILL, ARJUN YODH, University of Pennsylvania — We investigate the diffusion and thermodiffusion of micrometer-sized poly(N-isopropylacrylamide) (PNIPAM) gel particles in a temperature gradient. Recently published results of the thermophoretic mobility of PNIPAM systems are puzzling. Cross-linked microgel particles show unusually large thermophoretic mobility whereas the mobility of core-shell colloids and linear polymers are more consistent with other aqueous systems. Our experiments add to our empirical understanding of thermophoresis of PNIPAM particles. In particular, we study micrometer-sized PNIPAM particles, which are an order of magnitude larger than those previously studied. The size of the particles prohibits the use of optical beam deflection, the standard measurement technique. Instead, the thermophoretic mobility of the particles is measured using a novel optical system utilizing video microscopy and ring traps generated with holographic techniques.

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