# Dispersion Technology Inc. Newsletter #27

## *Electroacoustics of Particles Dispersed in Polymer Gel*

**Bibliography for Related Journal Article:**

Bhosale, P.S., Chun, J., And Berg, J.C. "Electroacoustics of Particles Dispersed in Polymer Gel", *Langmuir* **2011,** 27, 7376-7379

**Link to Article:**

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This study examines the electroacoustics of particles dispersed in polymer hydrogels, with the particle size either less than or greater than the gel mesh size. When the particles are smaller than the gel mesh size, their acoustic vibration is resisted by only the background water medium, and the measured dynamic electrophoretic mobility, μd (obtained in terms of colloid vibration current, CVI), is the same as in water. For the case of particles larger than the gel mesh size, μd is decreased due to trapping, and the net decrease depends on the viscoelastic properties of the gel. The gel mesh size was varied by varying its crosslink density, the latter being characterized as the storage modulus, G'. The dependence of mobility on G', for systems of a given particle size, and on particle size, for gels of a given G', are investigated. The measured mobility remains constant as G' is increased (i.e., mesh size is decreased) up to a value of approximately 300 Pa, beyond which it decreases. In the second set of measurements, the trapped particle size was increased in a gel medium of constant mesh size, with G' approximately 100 Pa. In this case, the measured μd is found to be effectively constant over the particle size range studied (14-120 nm), i.e., it is independent of the degree of trapping as expressed by the ratio of the particle size to the mesh size.