Low-conductivity, high permittivity media for electromanipulation

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***Abstract* — Cell and micro-particle manipulation by means of electric fields can be facilitated by increase of the permittivity of the suspension medium [1]. A useful dielectric enhancement can be achieved by addition of concentrations of zwitterions which usually also raise the conductivity of the medium: this pH-dependent side-effect can be undesirable. The sulfobetaines, which are now marketed for biotechnology because they afford protection to the structure of soluble proteins, do not cause a conductivity increment at any physiological pH. Characteristics of these materials will be presented, and their further applications discussed.**
[1] W.M. Arnold (2001) "Positioning and Levitation Media for the Separation of Biological Cells" IEEE Trans. Industry Applications 37, pp. 1468-1475 [2] N. Flores-Rodriguez and G. H. Markx (2004) "Improved Levitation and Trapping of Particles by Negative Dielectrophoresis by the Addition of Amphoteric Molecules" J. Phys. D: Appl. Phys. 37, pp. 353-361.