

Abstract Submitted
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Differential Dielectric Spectroscopy of Protein Solutions: Observation of Protein Interactions BRIAN MAZZEO, ANDREW FLEWITT, Cambridge University — Observation of a protein-protein interaction is illustrated by dielectric measurements on rabbit IgG (190 $\mu\text{g}/\text{ml}$) and Protein A (19 $\mu\text{g}/\text{ml}$) by a homemade dielectric cell and HP 4194A impedance analyzer. Frequency shifts of ratios 2.0 and 1.6 with respect to the individual relaxation characteristics of IgG and Protein A were obtained by dielectric spectroscopy, which has historically been used to determine the properties of solvated biomolecules to measure the hydrodynamic and electrical properties of individual proteins and of solution. Dielectric relaxation theory predicts changes in the dielectric relaxation characteristics of proteins due to protein interactions resulting in larger hydrodynamic volumes. Experimentally, bovine serum albumin, protein A, and rabbit IgG were added sequentially to phosphate buffer and the incremental dielectric changes were measured. The differential dielectric response, as a biophysical technique, gives insight into the interaction of the added protein with biomolecules in solution and can indicate the presence of protein-protein interactions.

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