

¹H NMR of Deep Eutectic Solvents

J. Lincoln Wallis¹, Liel Sapir², Daniel Harries², Horia I. Petrache¹, Bruce D. Ray¹

¹Department of Physics, IUPUI, Indianapolis, IN, ²Hebrew University, Jerusalem, Israel

Deep Eutectic Solvents (DESs) form between a variety of quaternary ammonium or phosphonium salts and hydrogen-bond donors. Over the past decade, DESs have been studied as green solvents with potential applications in industrial processes, chemical extractions, and pharmaceuticals. The recent suggestion that many plants produce natural deep eutectic solvents (NADES) from primary metabolites led to investigation of the potential uses of DESs in biophysics research. This study examined the ¹H NMR spectra of the choline chloride:urea 1:2, and choline chloride:ethylene glycol 1:3 molar ratio DES. Spectra of the choline chloride:urea 1:2 with various solutes were acquired to see what effect these solutes had on the DESs NMR spectrum. For both DESs tested, the NMR spectra were a superposition of the spectra of the components. DES-solute spectra showed that interaction between components persisted, indicating the solvent properties of the DESs were not lost upon addition of solutes.

Mentors: Horia I. Petrache, Department of Physics, Purdue School of Science, IUPUI; Bruce Ray, Department of Physics, Purdue School of Science, IUPUI