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| Title: | Ultrafast Solvation Dynamics of Deep Eutectic Solvents Using Spectrally Resolved Degenerate Pump- Probe & Impulsive Stimulated Raman Spectroscopy |
| Authors: | Yadav, Vivek |
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| Abstract: | One of the problems being faced by the researchers and industries is the use of volatile organic compounds (VOCs) which are hazardous, toxic, flammable, high priced, and environmentally damaging solvents. Therefore, researchers were forced to find alternatives to VOCs and this research led to a new solvent called deep eutectic solvents (DESs) which are non-volatile, non- flammable, and environmentally friendly solvents. So, In order to optimally use DES as a greener solvent, we have to understand its interaction with solutes. Here, in my MS dissertation, we explored some interesting aspects of ultrafast solvation dynamics of deep eutectic solvents (DESs) and their vibrational characteristics employing degenerate pump- probe spectroscopy and Impulsive stimulated Raman spectroscopy (ISRS). In this project, we investigated how a change in hydrocarbon chain length and number of hydroxyl groups influence the microscopic solution structure and nature of solute-solvent interactions, focusing on investigating the dynamics at an early timescale not acquired in previous studies. In addition, we also studied the vibrational fingerprint of solute-solvent interaction during solvation and specifically the participation of solvent modes using ISRS. |
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