



Monday, October 2, 2017, 12:00 pm
Seaver Science Library, Room 150

SSC Auditorium next to the library

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Ultrafast Vibrational Spectroscopy of Ionic Liquids: Insight into Carbon Capture, Chemical Reactions, and Energy Storage

Abstract:

Ionic liquids are complex solvents. Due to their unique properties, they are being explored for applications as carbon capture absorbents, electrolytes, and energy storage media. From a fundamental perspective, ionic liquids are at the forefront of research because of their structural and dynamical heterogeneity. Many important physical and chemical properties are dictated by the solvation shell around a molecule. The solvation shells are characterized by structure with short length-scales and dynamics on femtosecond to picosecond time-scales, which makes them difficult to observe with many conventional spectroscopies. Ultrafast vibrational spectroscopy, however, can measure the dynamics of the solvation shell around molecules directly. Here, we use ultrafast 2D-IR spectroscopy and supporting theory to explore the dynamics of ionic liquids relevant to several important applications. .

Suggested reading:

T. Brinzer, S. Garrett-Roe, "Temperature and chain length dependence of ultrafast vibrational dynamics of thiocyanate in alkylimidazolium ionic liquids: A random walk on a rugged energy landscape", J. Chem. Phys., Just Accepted (2017).

T. Brinzer, E. Berquist, Z. Ren, S. Dutta, C. Johnson, C. Krisher, D. Lambrecht, S. Garrett-Roe, "Ultrafast vibrational spectroscopy (2D-IR) of CO₂ in ionic liquids: Carbon capture from carbon dioxide's point of view," J. Chem. Phys. **142**, 212425 (2015). Download: <http://dx.doi.org/10.1063/1.4917467>

Hosted by Professor Anna Krylov

The scientific community is invited

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