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Intermolecular vibrations of room temperature ionic liquids studied by femtosecond Raman-induced Kerr effect spectroscopy

Room temperature ionic liquids (RTILs) purely consist of cations and anions (without solvent), but they are liquids at room temperature. RTILs possess characteristic features, such as low melting point, negligible vapor pressure at ambient temperature and pressure (and thus less flammable), and so on. Such unique properties are mainly attributed to the complex intermolecular interactions in RTILs. Because the intermolecular vibrations reflect the microscopic structure and intermolecular interactions in condensed phases, it is essential to study them to understand RTILs in detail. Femtosecond Raman-induced Kerr effect spectroscopy (fs-RIKES) detects the molecular motions in the low-frequency or THz region ($\sim 0.3\text{--}700\text{ cm}^{-1}$ or $\sim 0.01\text{--}20\text{ THz}$) where the

intermolecular vibrational bands in most condensed phases locate. Therefore, fs-RIKES is useful to study condensed phases including RTILs. In this talk, I am going to show some results of fs-RIKES studies of RTILs, such as temperature dependent low-frequency spectral features and effects of aromatic ring on the low-frequency spectrum.

Speaker Biography

Hideaki Shirota received his PhD from the Graduate University for Advanced Studies, Japan. He is an associate professor of chemistry in Chiba University. His current research interests include molecular spectroscopy, laser spectroscopy, time-resolved spectroscopy, molecular dynamics in condensed phases, reaction dynamics in solutions, and solution chemistry.

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