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Thwarting Crystallization through Hydrogen Bonding in Triazine Molecular Glasses AUDREY LAVENTURE, University of Montreal, ARMAND SOLDERA, University of Sherbrooke, OLIVIER LEBEL, Royal Military College of Canada, CHRISTIAN PELLERIN, University of Montreal — Using irregular shaped molecules interacting weakly with each other is the most intuitive choice to generate amorphous molecular materials. In contrast, H-bonds are commonly used in crystal engineering to create predictable ordered and well-packed structures. In spite of this fact, Lebel et al. have demonstrated that H-bonds can be used efficiently to thwart crystallization by inducing the self-assembly of aggregates that pack poorly. Since 2006, libraries of triazine derivatives with a variety of different substituents capable of forming molecular glasses have been synthesized and studied. Their outstanding glass-forming ability (with critical cooling rates lower than 0.5 °C/min) and their wide range of Tg (from below ambient temperature up to 160 °C) make them an attractive amorphous model system to deepen our understanding of the relationship between microscopic features and macroscopic behavior of glasses. In this presentation, we will show that variable-temperature infrared spectroscopy is a tool of choice to probe the vitreous state of these compounds. We take advantage of the selectivity of this technique to correlate their molecular features to their thermal properties. Quantitative monitoring of hydrogen bonds during vitrification will be addressed.

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