

Abstract Submitted  
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**Raman spectroscopic studies of polyfluorenes upon thermal cycling**<sup>1</sup> M. ARIF, S. GUHA, Dept. of Physics, University of Missouri-Columbia, MO, B. TANTO, M.J. WINOKUR, Dept. of Physics, University of Wisconsin-Madison, WI — Polyfluorenes (PFs) have emerged as attractive alternatives to other pi-conjugated polymers for organic optoelectronics due to their strong blue emission, high charge mobility and excellent chemical and thermal stability. Almost all PFs utilize side-chain substituents that improve solution processing as well as confer new functionality. Thermal cycling of PFs results in distinct backbone and side-chain conformations that lead to improved optical and electronic properties. In this work we present detailed Raman scattering studies of a branched (PF2/6) and non-branched (PF8) PF as a function of temperature to investigate phase transitions and molecular ordering. The low frequency Raman peaks between 100-1000  $\text{cm}^{-1}$  are extremely sensitive to the local chain conformation, side chain moiety, and are strongly impacted by thermal cycling. Our results are further compared with X-ray diffraction and gas phase molecular modeling calculations.

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