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Enhancing sensing of nitroaromatic vapors by thiophene-based polymer films G. NAGARJUNA, University of Massachusetts Amherst, ABHISHEK KUMAR, AKSHAY KOKIL, University of Massachusetts Lowell, KEDAR JADHAV, SERKAN YURT, University of Massachusetts Amherst, JAYANT KUMAR, University of Massachusetts Lowell, D. VENKATARAMAN, University of Massachusetts Amherst — Sensing of nitroaromatic-based explosives is important for homeland security and for the detection of landmines in war zones. These compounds are detected using fluorescence quenching of poly(phenyleneethynylene) (PPE). When compared with PPE, polythiophenes have several features that make them excellent candidates for sensing. However, due to strong $\pi - \pi$ aggregation in polythiophenes, the permeation of the analyte in the thin film is poor. Therefore polythiophenes have poor quenching efficiencies. We have addressed this problem by tuning the side chains on these polymers to disrupt the polymer aggregation, thereby enhancing the analyte diffusion into the polymer thin film. We have now developed a materials platform for next generation sensory materials based on polythiophenes. This talk will discuss our approach and the studies that showed enhanced sensing of nitroaromatics in polythiophene thin films.

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