An Adventure in TTFV Chemistry: From Small Molecules to Functional Materials

Since the first discovery in the early 1970s that the salts of tetrathiafulvalene (TTF) could exhibit very high electrical conductivity,\(^1\) TTF and its various derivatives have become the most extensively investigated molecular building blocks in the field of organic electronics.\(^2\) TTF is an excellent p-electron donor, owing to the gain of aromaticity in its oxidized forms. Over the past decades, the development of TTF derivatives with extended p-conjugated molecular frameworks has enabled other fascinating molecular and supramolecular properties to be intermarried with TTF. In our group, a unique class of p-extended TTFs, namely tetrathiafulvalene vinylogues (TTFVs) has been studied for years.\(^3\) This seminar will give an overview of our adventure in the synthesis, characterization, and application of novel TTFV derivatives. Detailed discussions are focused on three subtopics: (i) structure-property relationships for aryl-substituted TTFVs,\(^4\) (ii) TTFV-based molecular tweezers and macrocycles,\(^5\) and (iii) stimuli-responsive TTFV polymers.\(^6\)

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