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Insights into linear supramolecular polymer formation via TPE and BODIPY containing host-guest interaction

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We report the construction of novel host H1 and guest G1 consisting TPE and BODIPY linked together with the dibenzo-24-crown-8 macro cycle and secondary ammonium salt respectively for the host guest interactions. As a proof of concept recognition of secondary ammoniums by 24-crown-8 macro cycle resulted a linear supramolecular polymer (pseudorotaxanes) in situ where the main chain was composed of TPE and BODIPY as a donor-acceptor pair. Occurrence of intra molecular FRET from TPE to BODIPY and related prominent changes into absorption bands determined the stoichiometric ratio as the primary evidence of polymerization which were then further confirmed by ¹H-NMR and other spectroscopic techniques. Moreover, interaction of host macro cycle with K⁺ ion destructed the supramolecular polymer formation, which was a property of the reporter groups. Interestingly, cation characteristics of triazoles into guests under acidic conditions were also capable of destructing the conjugates of host and guest of polymer, especially due to electrostatic repulsion. Overall, cleavage of supramolecular assembly via interaction of K⁺ ion and cationic triazoles may push the limit of polymer towards exploring the critical mechanism involving such events in biology or other applications.

Biography

Chinmayananda Gouda completed his BS and MS in Organic Chemistry at Berhampur University in 2008 and in 2012, respectively. In 2013, he joined Laboratory of Prof. Hong-Cheu Lin at National Chiao Tung University, Taiwan, to pursue his PhD in Materials science and Engineering. His current research interests are focused on "Synthesis and assembly of crown-ether cycle, molecular recognition and linear supra molecular polymer based on host-guest chemistry."

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