Synthesis of Soluble Backbone-unsubstituted π-Conjugated Molecules

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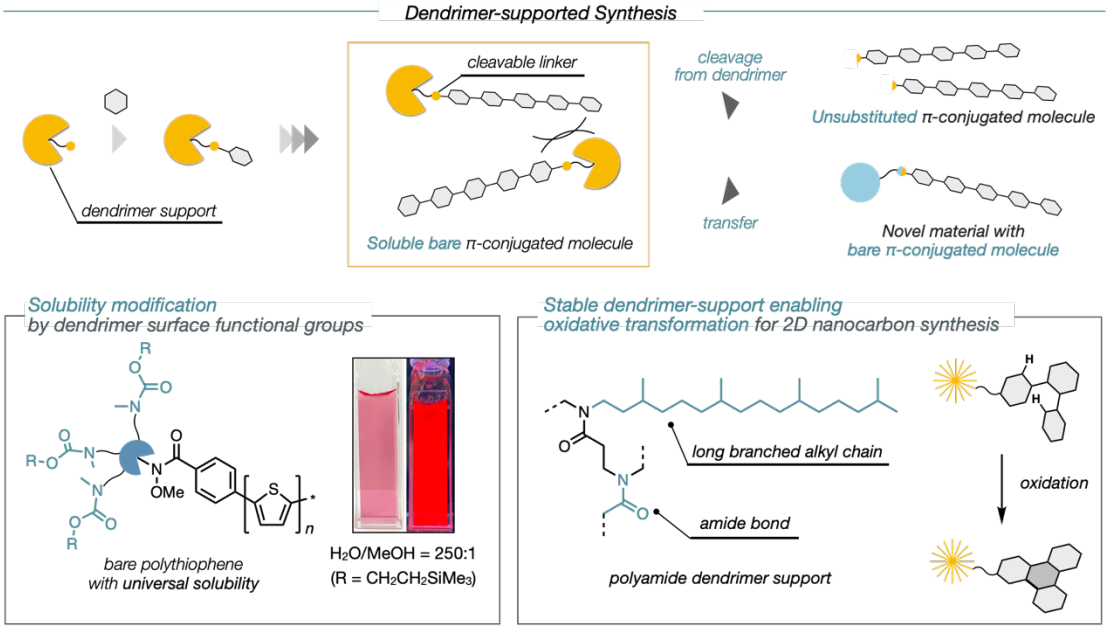
Keywords: *Molecular Nanocarbons; Insoluble Compound; Dendrimer*

π-Conjugated molecules including aromatic polymers and nanographenes are promising molecular entities for electronic devices. Because of their strong intermolecular interactions, planar π-conjugated molecules easily form aggregates. In order to suppress the aggregation, long alkyl or alkoxy chains are often installed as substituents. Since the substituents cause the change of physical properties, a synthetic method for bare, namely backbone-unsubstituted, π-conjugated molecules is highly demanded. Recently, we reported a novel synthetic method to access bare aromatic polymers.[1] In this synthetic method, bare aromatic polymers can be synthesized on huge poly(aryl alkyl ether) dendrimers in order to prevent aggregation. Since the thus-obtained dendrimer-ligated aromatic polymers are highly soluble to hexane, THF and chloroform, they can be transformed to truly unsubstituted cognate and hybridized with non-organic materials such as protein and silica gel. In addition, solubility modification can be achieved by introducing carbamate groups to the dendrimer surface. The bare polythiophenes attached to the dendrimer containing 18 carbamate groups have universal solubility from hexane to water/methanol = 250:1. Since the poly(aryl alkyl ether) dendrimer is fragile under oxidative reaction condition, more stable dendrimer support was also designed to expand the synthetic scope of our strategy. Thus, a stable polyamide dendrimer bearing 16 long branched alkyl chains on its periphery was synthetized and oxidative synthesis of bare two-dimentional π-conjugated molecules were examined on the polyamide dendrimer support.



[1] Fujiki, S.; Amaike, K.; Yagi, A.; Itami, K. *Nat. Commun.* **2022**, *13*, 5358.