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Conjugated molecules

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Propositions

accompanying the dissertation

CONJUGATED MOLECULES

Design and synthesis of π-conjugated materials for optoelectronic and thermoelectric applications

Gang Ye

1. Organic molecular and polymeric semiconductors are attractive for the fabrication of cost-effective, large-area, mechanically flexible electronic devices via solution-based, high-throughput patterning techniques such as slot-dye coating or printing.

   - Chemical Reviews 114, 8943 (2014).

2. Bis(pinacolato)diboron-mediated homopolymerization opens a new pathway to aromatic polyketones. (Chapter 2)

3. Conjugated polyions enable organic photovoltaics processed from green solvents. (Chapter 3)

4. Molecular engineering of side chains is a versatile approach to the modification of the processability, as well as the electrical and optical properties of conjugated polymers. The appropriate selection and attachment of side chains involves the art of balancing several factors. (Chapter 3 & Chapter 4)

5. Naphthalene diimides (NDI) possess high electron affinity, good charge carrier mobility and excellent thermal and oxidative stability, making them promising candidates for organic-electronic applications such as photovoltaic devices, and flexible displays.

   - Chemical Reviews 116, 11685 (2016)

6. Molecular doping is a key strategy for achieving high-performance organic thermoelectric devices based on conjugated polymers. (Chapter 4 & Chapter 5)

7. Understanding the structure–function relationships of conjugated molecules has provided advanced materials to the field of organic electronics.

8. Side products can give a chemist a surprise.