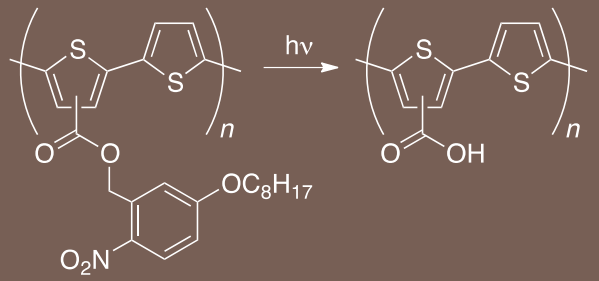
PHOTOINDUCED AGGREGATION OF POLYTHIOPHENES

Problem

- Solubilizing alkyl chains on conjugated polymers are necessary to enable solution-based processing of optoelectronic devices.
- Soluble thin films of these materials, however, prevent all-solution multilayer film formation.
- Other drawbacks of solubilizing chains:
  - Occupy space with inactive atoms
  - Increase rate of photochemical decomposition

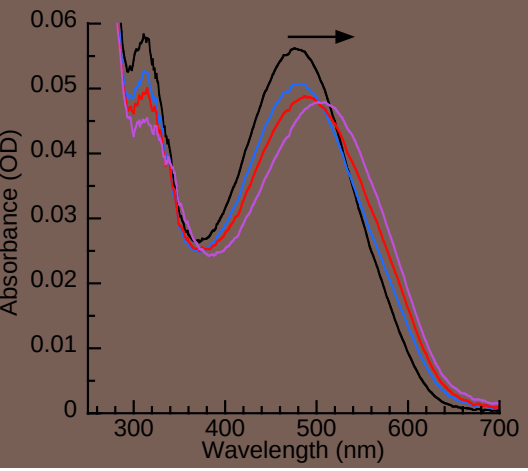
Approach

- Link long alkyl chains to polymer backbone through photocleavable groups.
- Allows removal of solubilizing chains with light



Results Upon UV Photolysis

Red Shift: Polymer Aggregates In Solution



Film Insoluble Upon UV Irradiation

Future Work and Applications

- Extend to other materials such as donor-acceptor polymers.
- Demonstrate all-solution processed multilayer film
- Photolithographic patterning of conjugated polymers.
- Investigate observed red-shift of benzyl ester side-chains on optical properties of materials.

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