Organic Semiconductor Materials via Simplified Synthetic Pathways
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Introduction

In the field of organic semi-conductors (OSC) developed for organic photovoltaic cells (OPV), the environmental impact of the synthesis of organic materials has recently been highlighted. Indeed, the synthetic procedures for the conception of organic semiconductors are essentially based on organometallic couplings or Wittig type reactions giving toxic by-products. Moreover, the purification of polymers or small molecules often uses large amounts of solvent without ensuring the high level of purity required for semiconductors. The use of direct heteroarylation for the synthesis of conjugated systems is now well established and allows to decrease the environmental impact to do giving toxic byproducts. Moreover, the purification of polymers or small molecules often uses large amounts of solvent without ensuring the high level of purity required for semiconductors. The use of direct heteroarylation for the synthesis of conjugated systems is now well established and allows to decrease the environmental impact to do giving toxic byproducts.

Green Approach for OPV

In the field of organic semi-conductors (OSC) developed for organic photovoltaic cells (OPV), the environmental impact of the synthesis of organic materials has recently been highlighted. Indeed, the synthetic procedures for the conception of organic semiconductors are essentially based on organometallic couplings or Wittig type reactions giving toxic by-products. Moreover, the purification of polymers or small molecules often uses large amounts of solvent without ensuring the high level of purity required for semiconductors. The use of direct heteroarylation for the synthesis of conjugated systems is now well established and allows to decrease the environmental impact to do giving toxic byproducts. Moreover, the purification of polymers or small molecules often uses large amounts of solvent without ensuring the high level of purity required for semiconductors. The use of direct heteroarylation for the synthesis of conjugated systems is now well established and allows to decrease the environmental impact to do giving toxic byproducts.

Synthesis of Precursors

- Dissymmetric block
  - Direct Arylation on Dissymmetric block
  - Condensation
  - Functionalization of Dissymmetric block
  - Condensation
  - Functionalization of 3-cyano-thiophene
  - Condensation

Direct Arylation

- Direct Arylation on Dissymmetric block
- Direct Arylation with 4-bromotriphenylamine
- Direct Arylation with 4-bromotriphenylamine on Protect Aldehyde

Optical Spectroscopy


Conclusion - Outlook

- We synthesized a new series of D-A and D-A-D materials by following a green approach: direct heteroarylation and condensation.
- The effect of cyano group building block shows a GAP diminution.
- The optical and electrochemical properties suggest a possible application as donor semiconductors in organic solar cells.

Bibliography