Synthesis and Characterization of Semiconducting Polymers Achieved by Benzotriazolyl Bis(trifluoroborate)

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Abstract

In this presentation, we show that a heteroaromatic bis(trifluoroborate) makes a stable and easy-to-purify yet reactive monomer under Suzuki polycondensation conditions. A dipotassium bis(trifluoroborate) of 2-alkylbenzotriazole was synthesized efficiently and copolymerized with dibromobenzothiadiazole (**P1**), dibromofluorenone (**P2**) and dibromonaphtalene-bis(dicarboximide) (**P3**) in the presence of a Pd catalyst and Li-based inorganic bases, resulting in the achievement of high molecular weight semiconducting polymers. In particular, the polymer, **P1**, composed of all electron-accepting benzotriazole and benzothiadiazole units shows excellent electron-transport properties (μ_e = 0.02 cm2 V-1 s-1), which proves the value of the heteroaryl bis(trifluoroborate) monomer and suggests that another high-performance semiconducting polymer can be achieved by our unique polymerization protocol.

References

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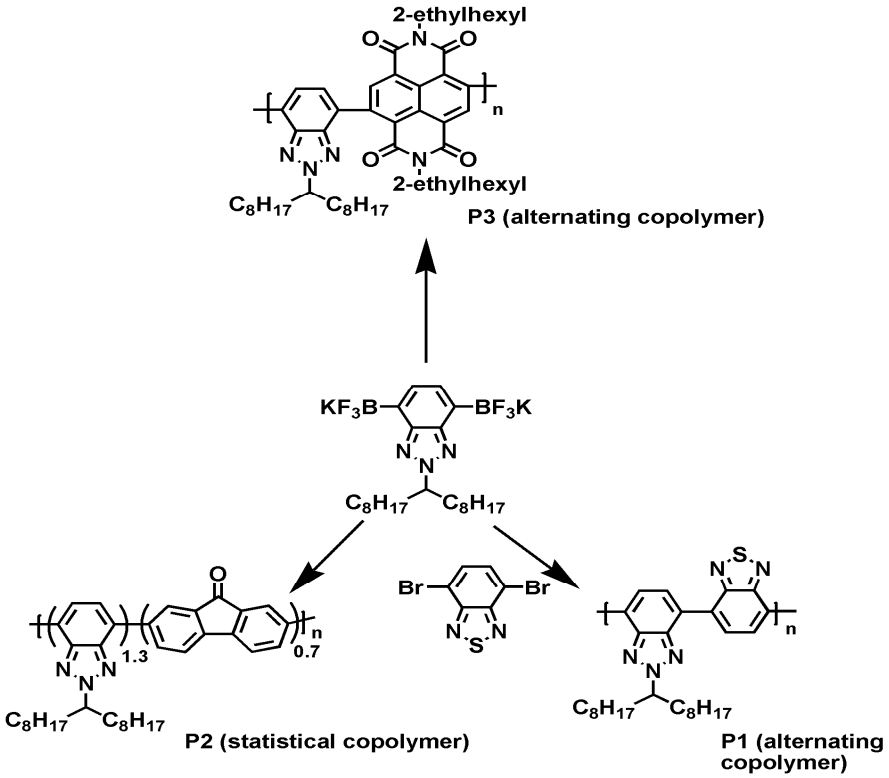
Figures



Scheme 1. Synthesis of copolymers **P1**, **P2** and **P3**.