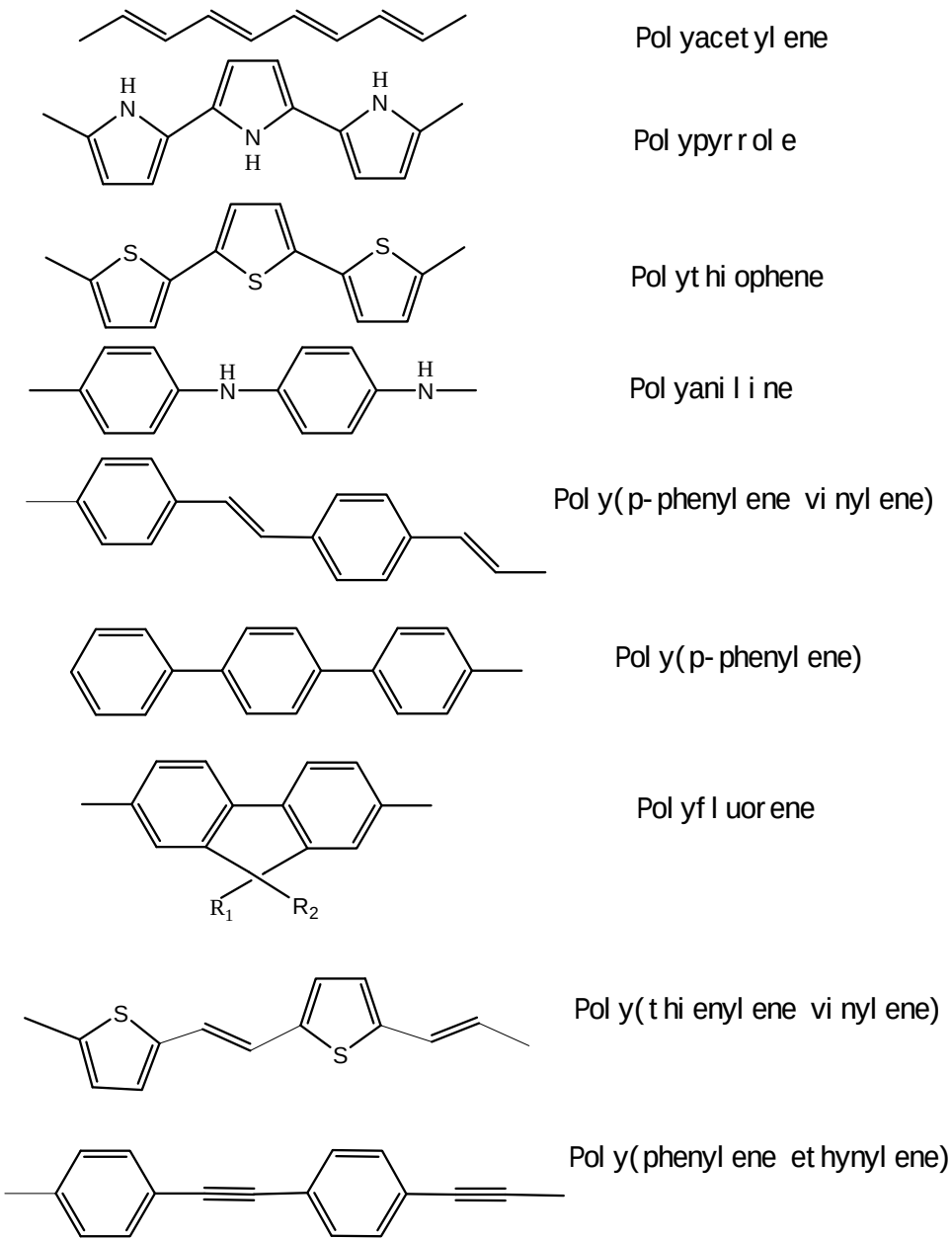


Figure 6.1 Molecular structures of the major classes of conjugated polymers

CRC Press, 2008. ISBN-10: 0849392845

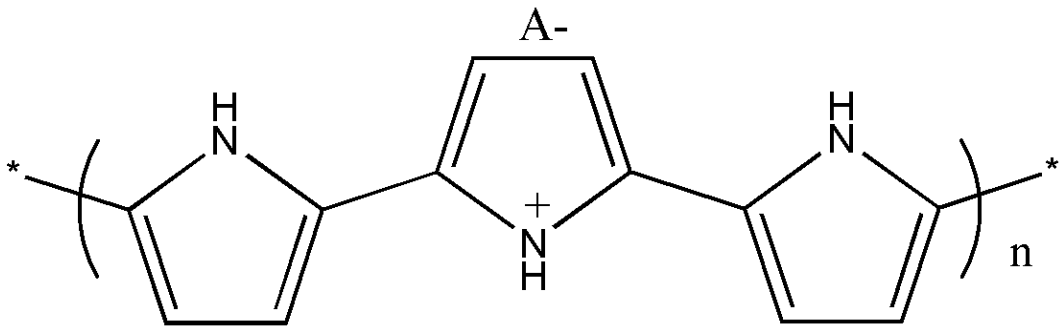


Figure 6.2 *p*-doping structure of polypyrrole (A^- represents counter anion)

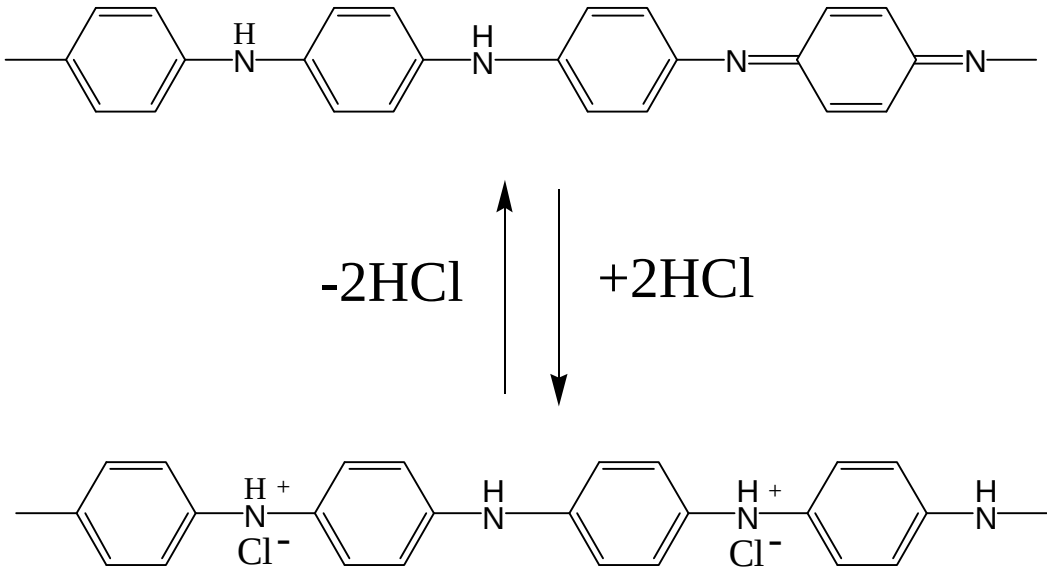


Figure 6.3 Proton acid doping of polyaniline (the upper molecular structure of PAn is called emeraldine PAn)

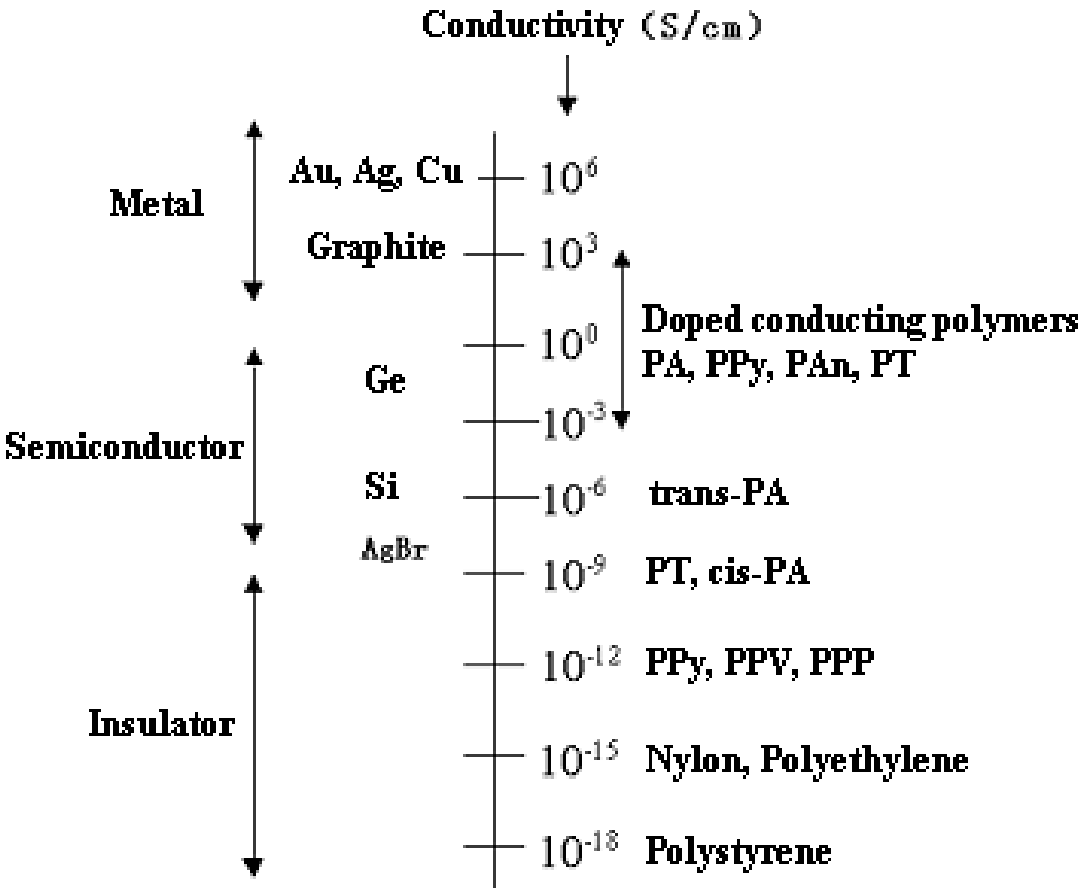


Figure 6.4 Comparison of the conductivity of conducting polymers with other electronic materials

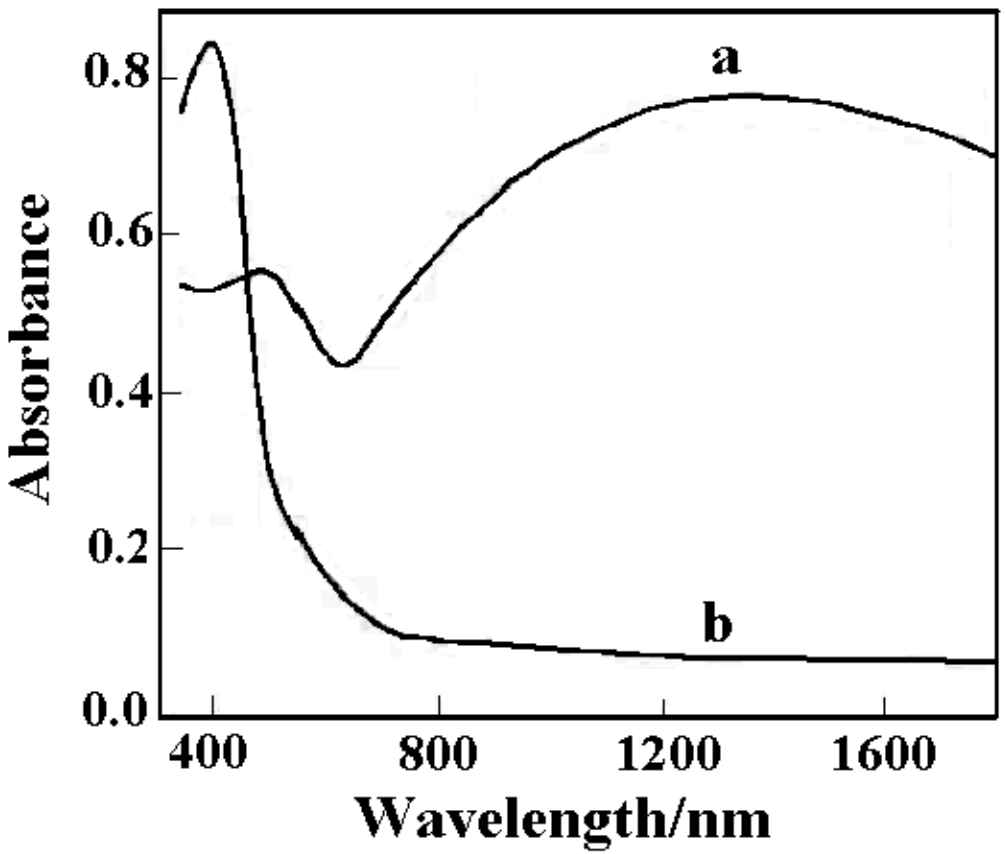


Figure 6.5 Absorption spectra of PPy, (a) *p*-doped state; (b) neutral state

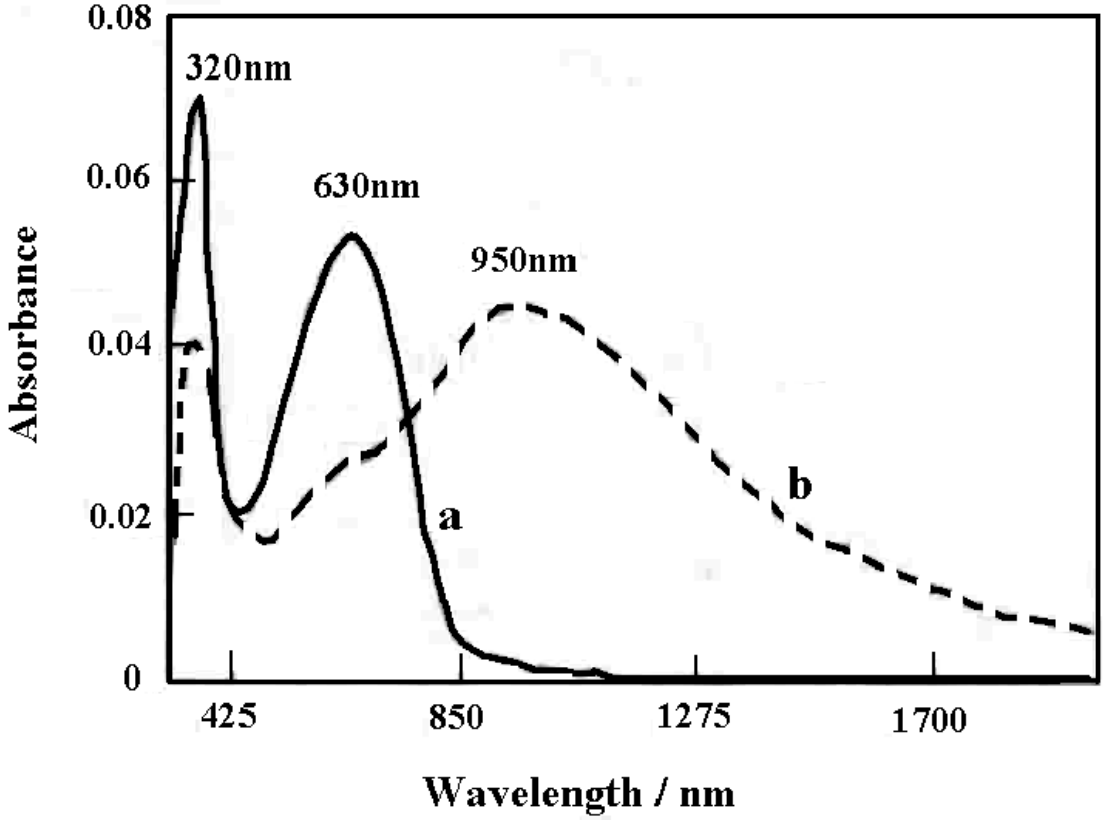


Figure 6.6 Absorption spectra of PAn: (a) emeraldine PAn; (b) proton acid doped PAn

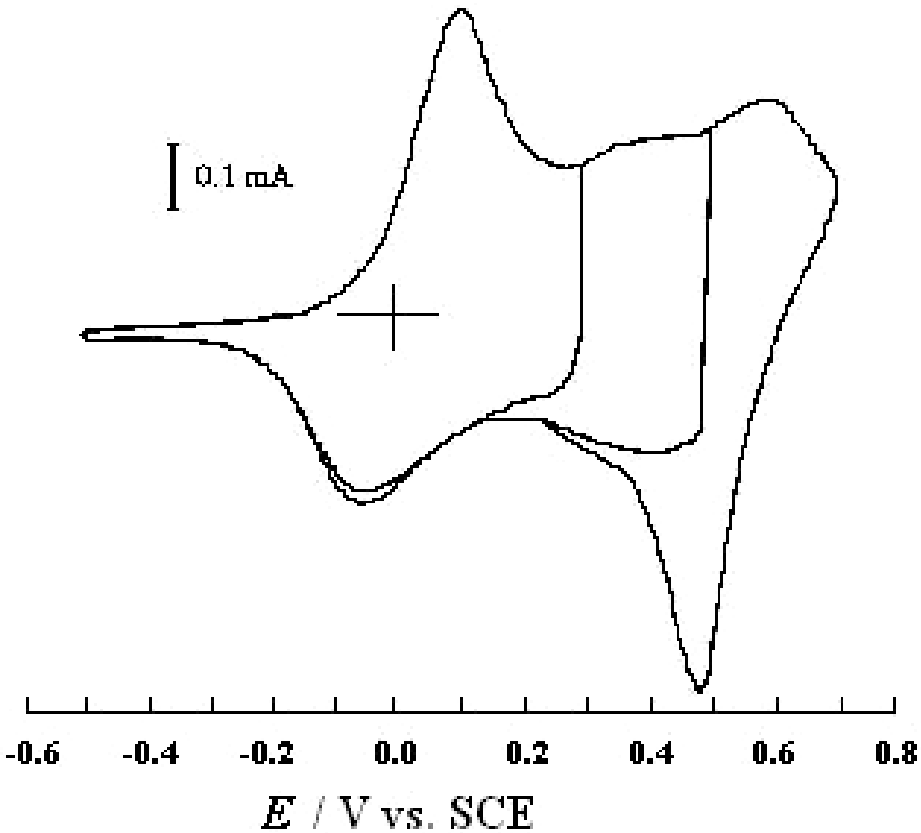
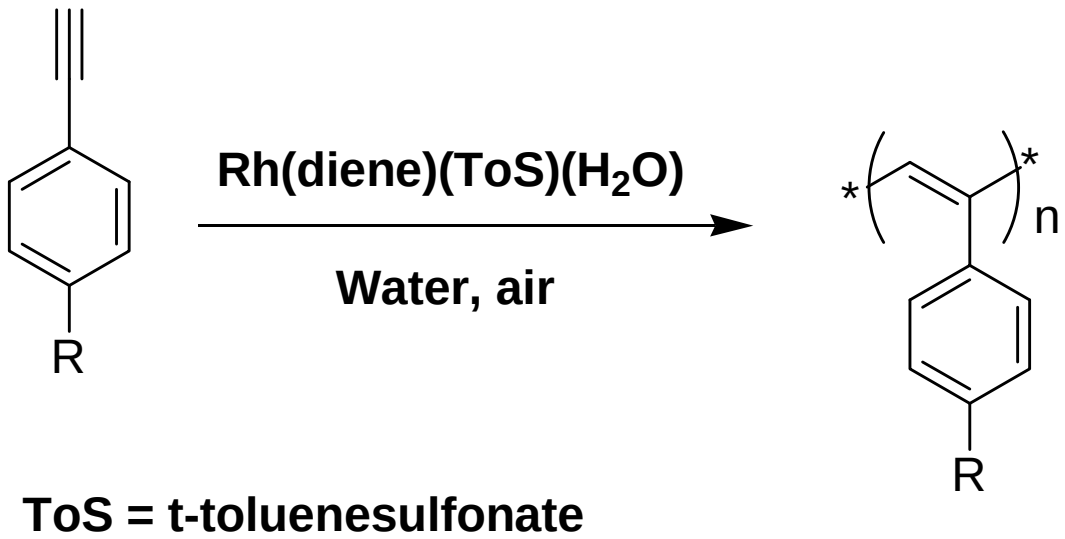


Figure 6.7 Cyclic voltammograms of PAn(NO_3^-) in pH 1.5，1 mol/L $NaNO_3$ aqueous solution, v = 40 mV/s



Scheme 6.1 Synthesis of polyacetylene derivatives with functional pendants.

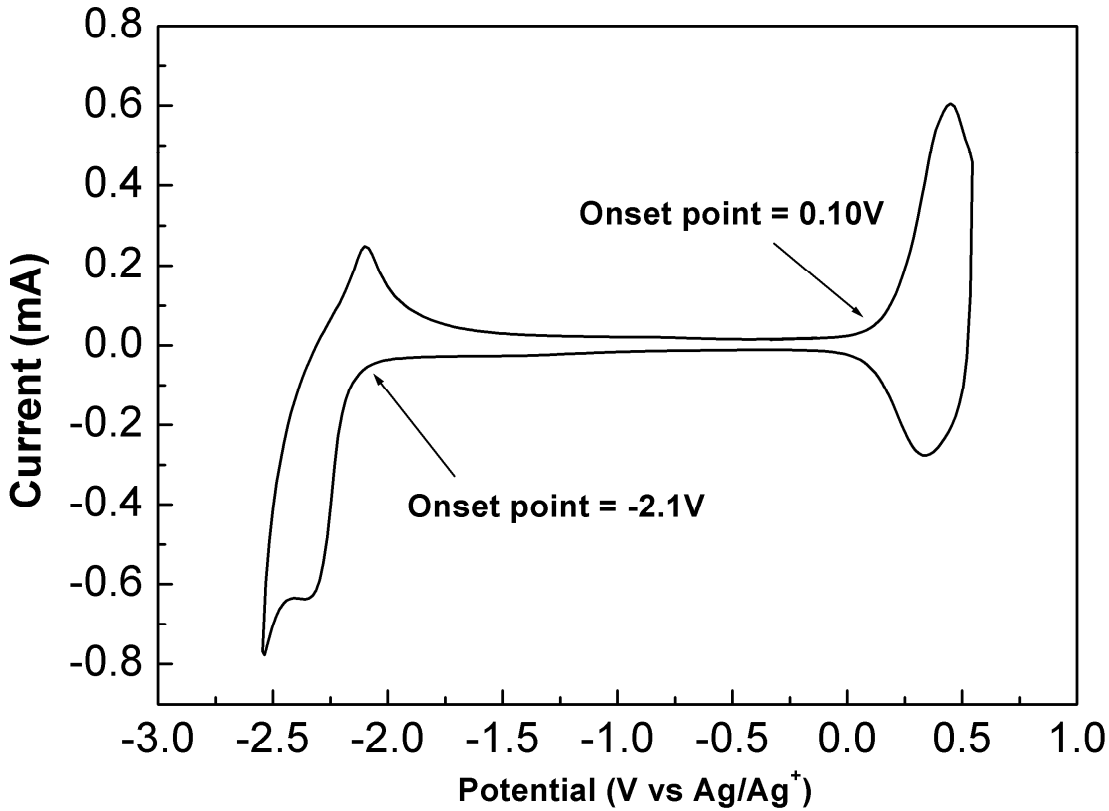


Figure 6.8 Cyclic voltammogram of poly(3-hexylthiophene) film on Pt electrode in 0.1 M Bu4NPF$_6$ acetonitrile solution

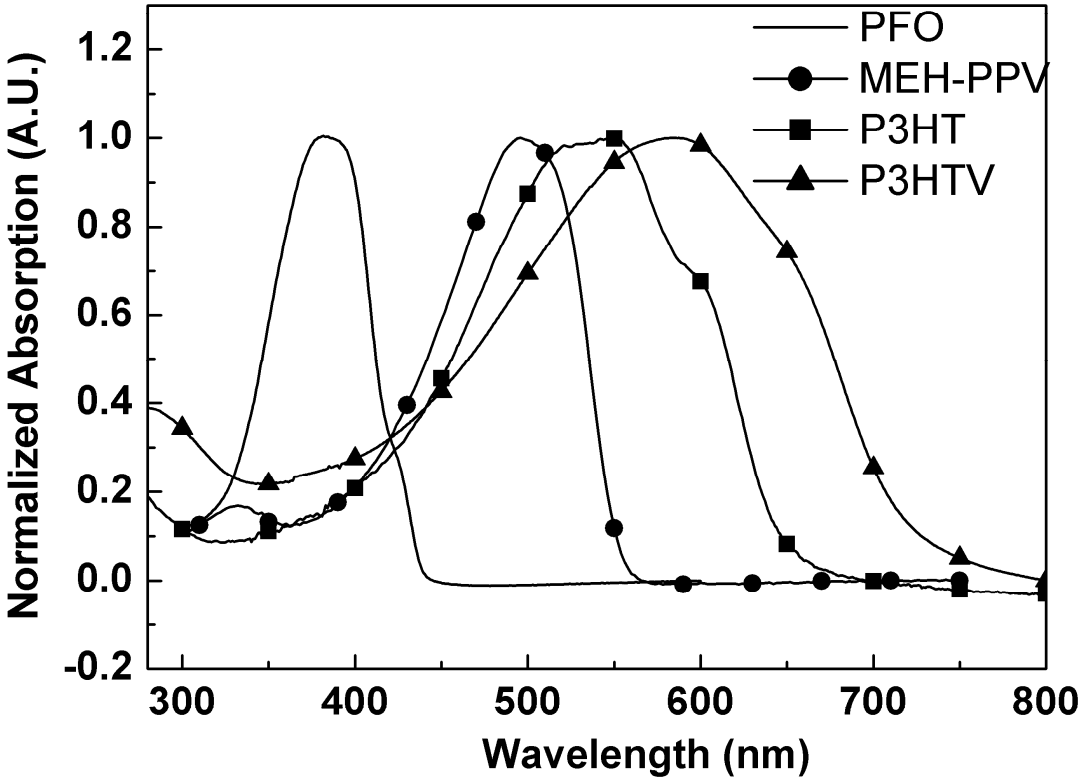


Figure 6.9 Absorption spectra of PFO, MEH-PPV, P3HT and P3HTV.

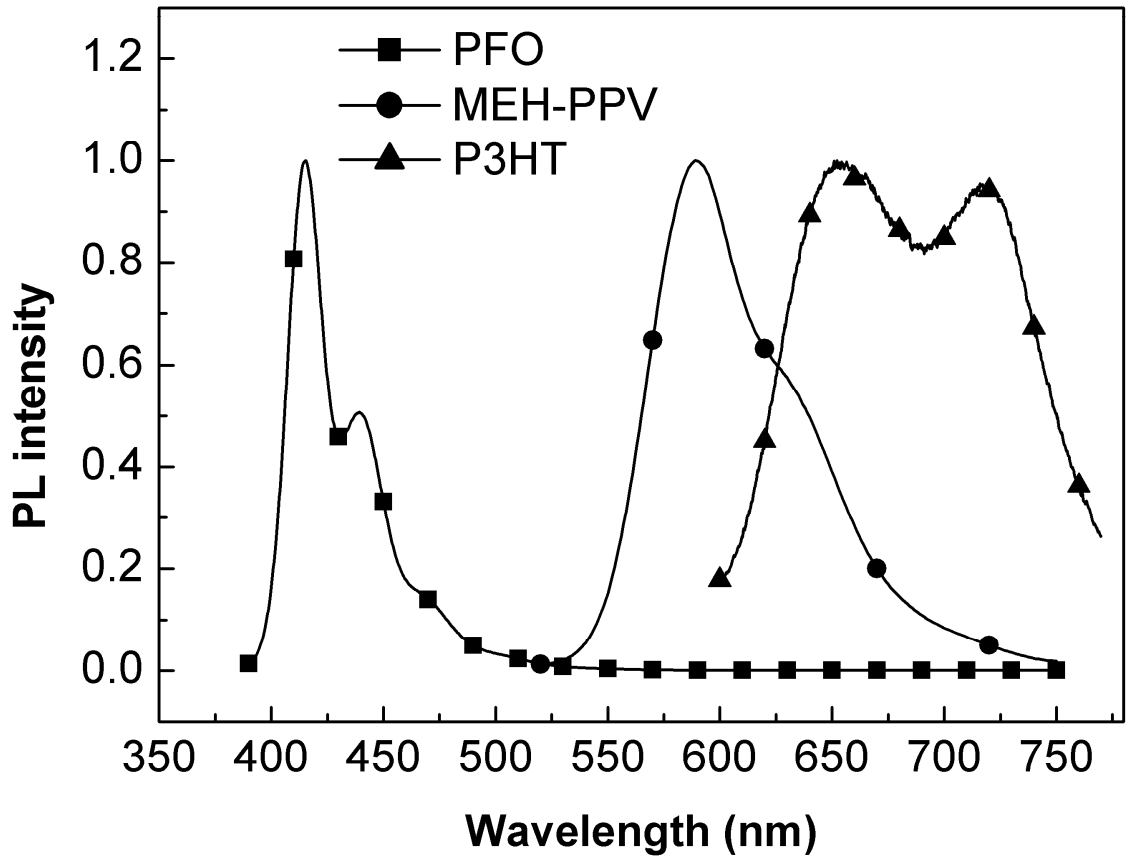


Figure 6.10 Photoluminescence spectra of PFO, MEH-PPV and P3HT films

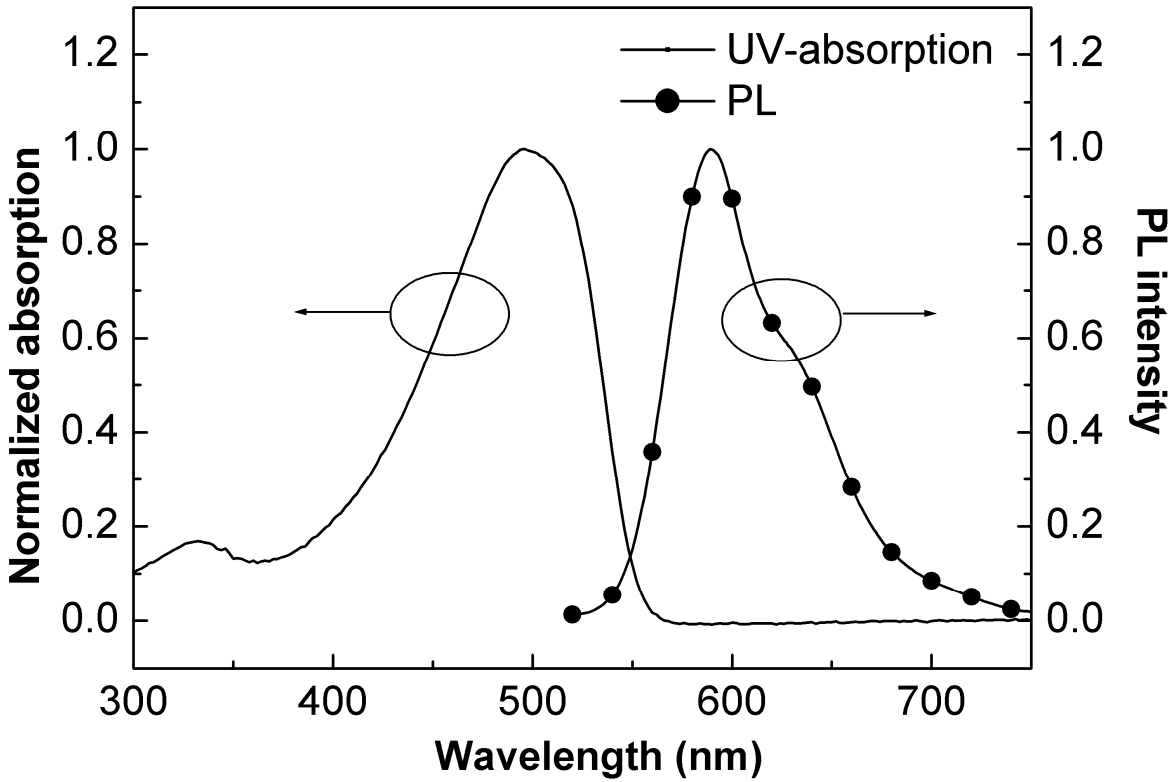


Figure 6.11 Absorption and PL spectra of MEH-PPV film

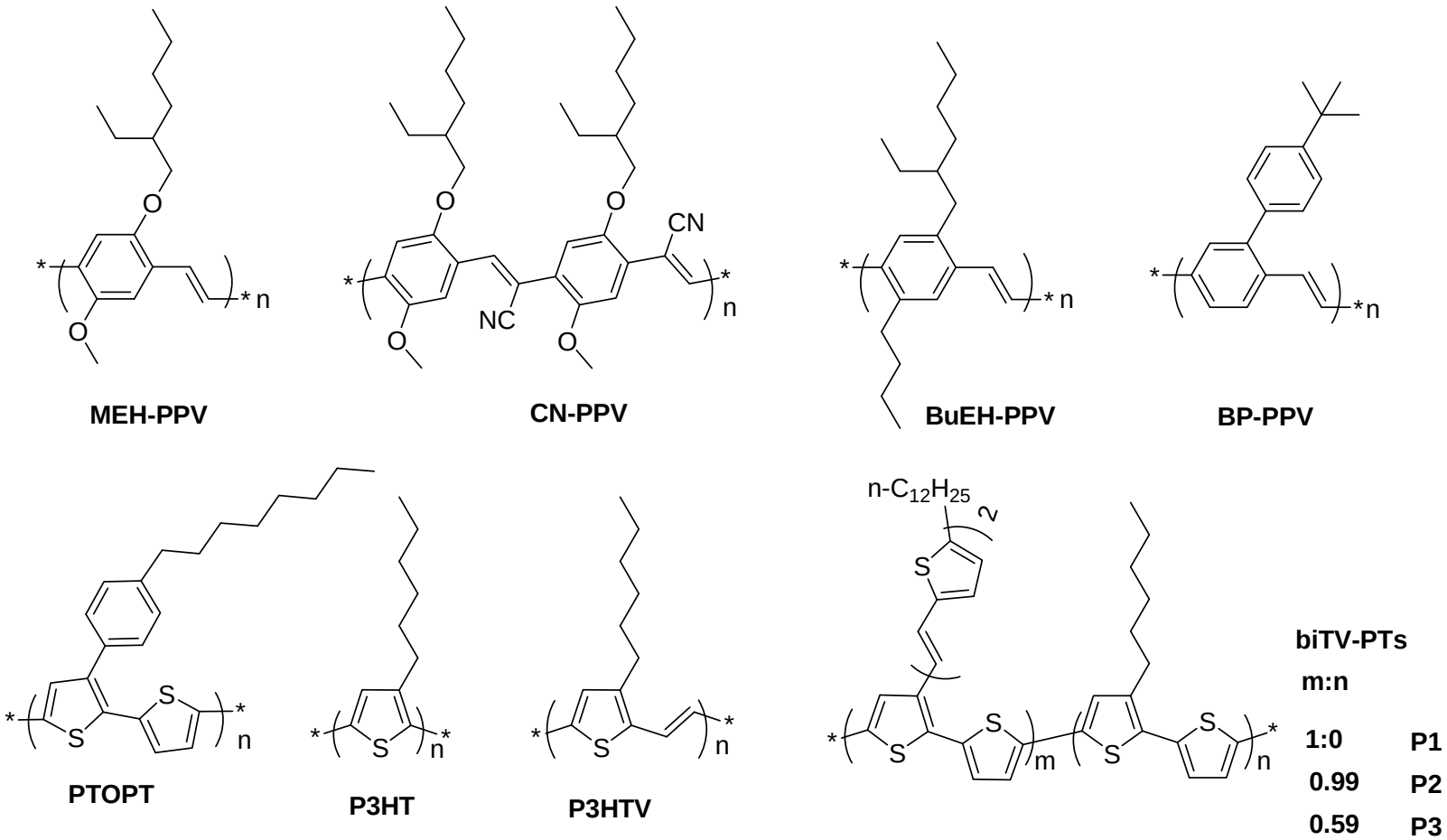


Figure 6.12 Molecular structures of some conjugated polymer derivatives with side-chains.

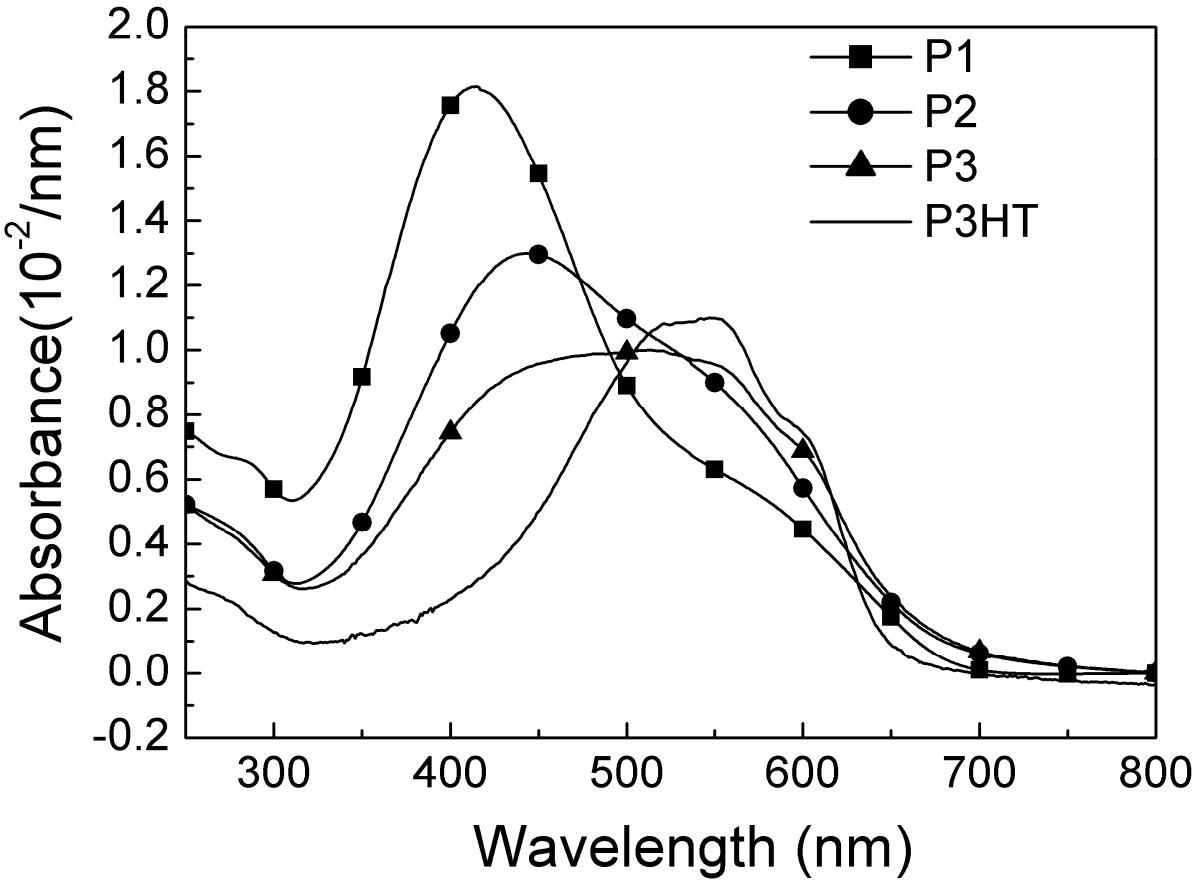
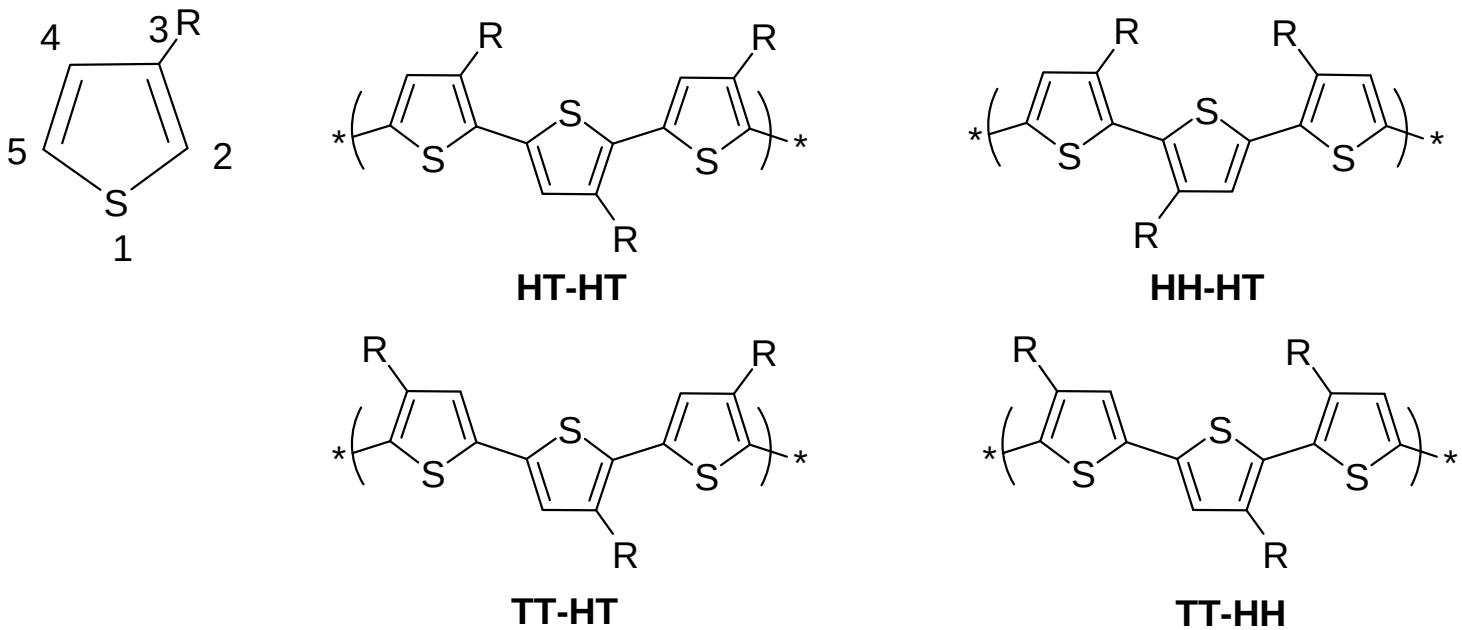
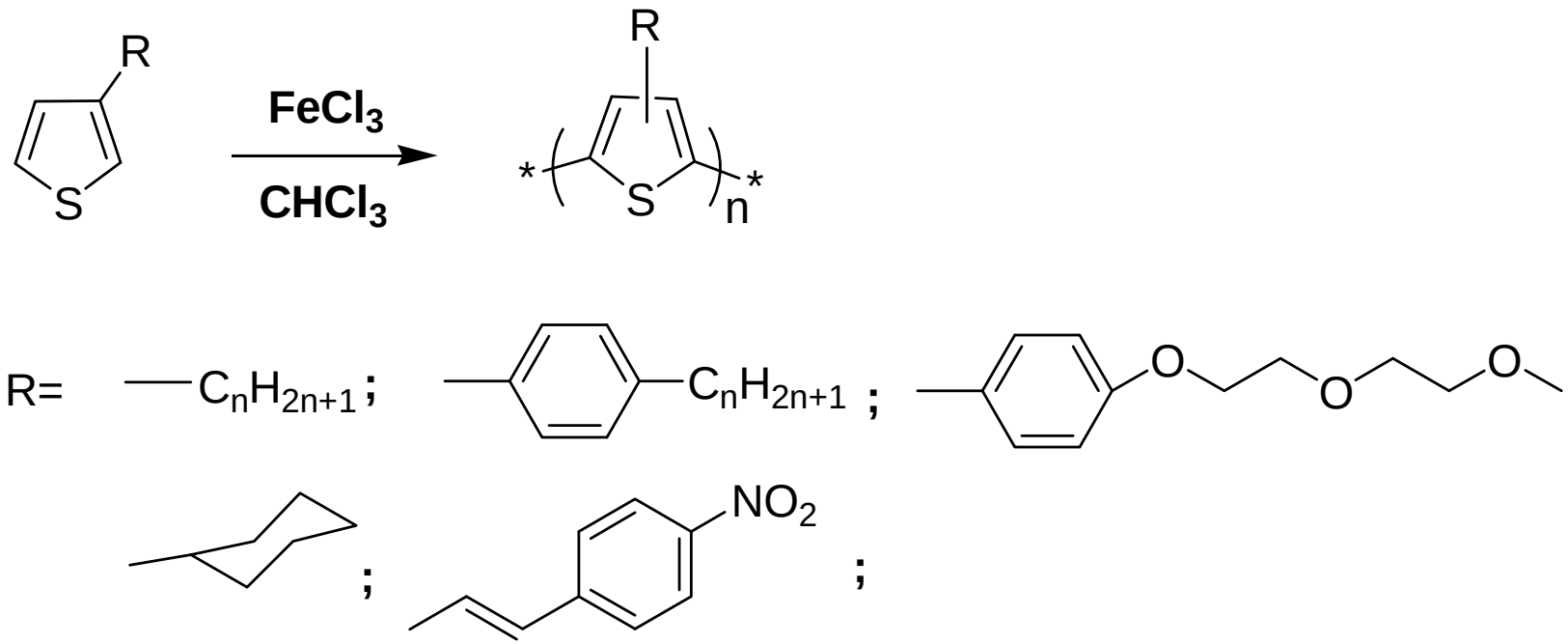


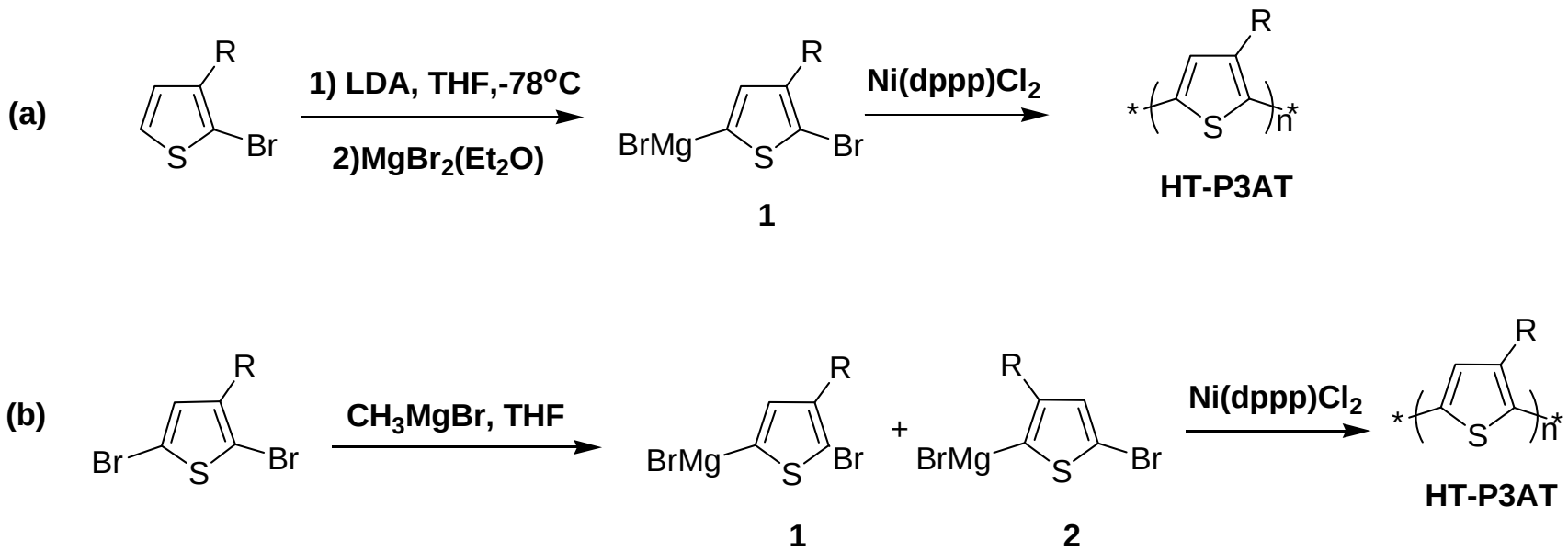
Figure 6.13 Absorption spectra of P3HT and the bithienylenevinylene substituted polythiophene film



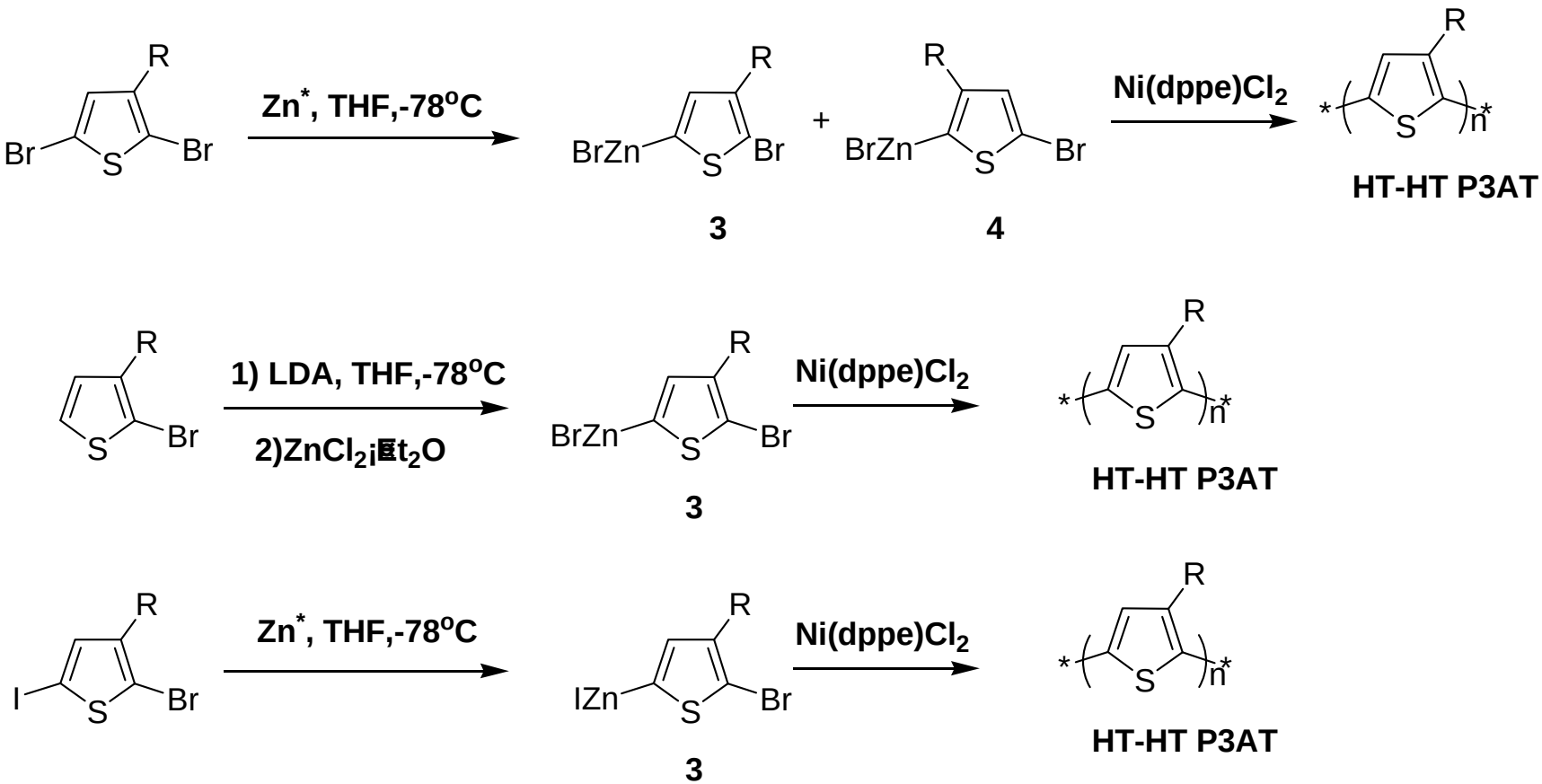
Scheme 6.2. Monomer position number and possible regiochemical coupling in poly(3-substituted thiophene)s



Scheme 6.3 Preparation of polythiophene derivatives by $FeCl_3$ oxidation.

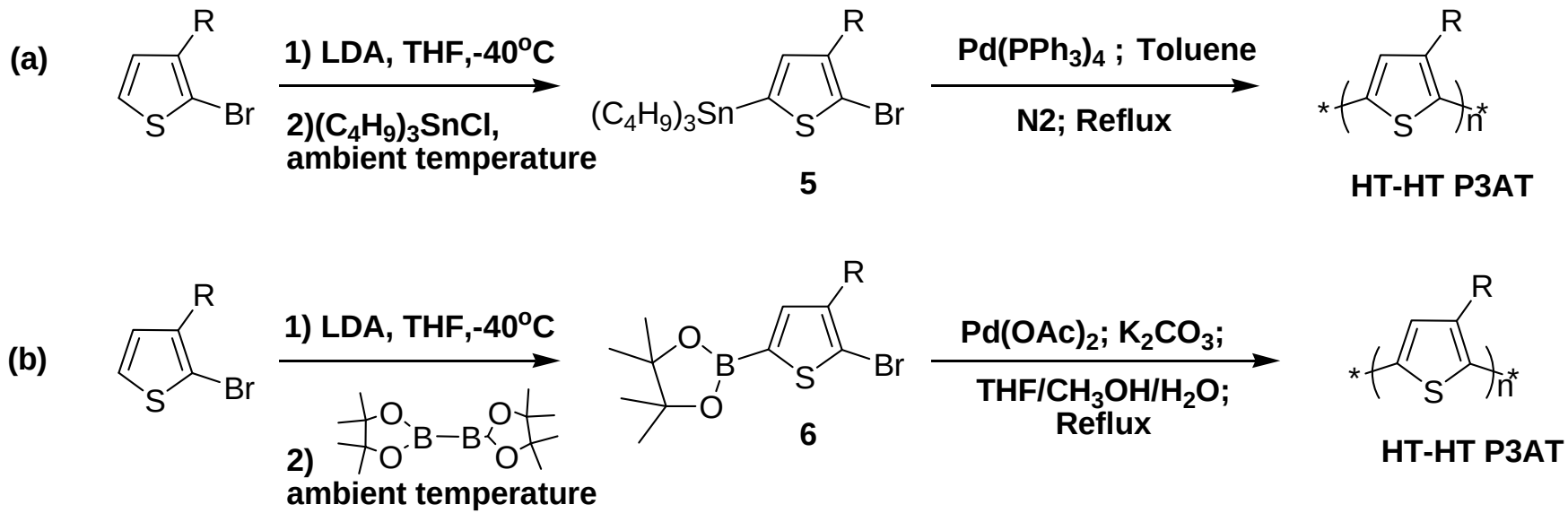


Scheme 6.4 Synthesis of HT-HT P3ATs by the (a) McCullough and (b) GRIM method

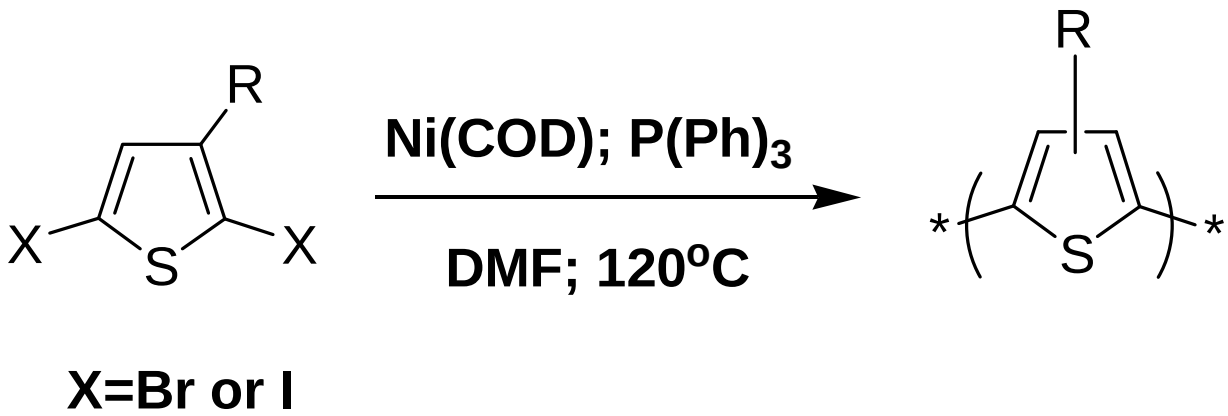


Scheme 6.5 Synthesis of HT-HT P3AT by the Rieke method.

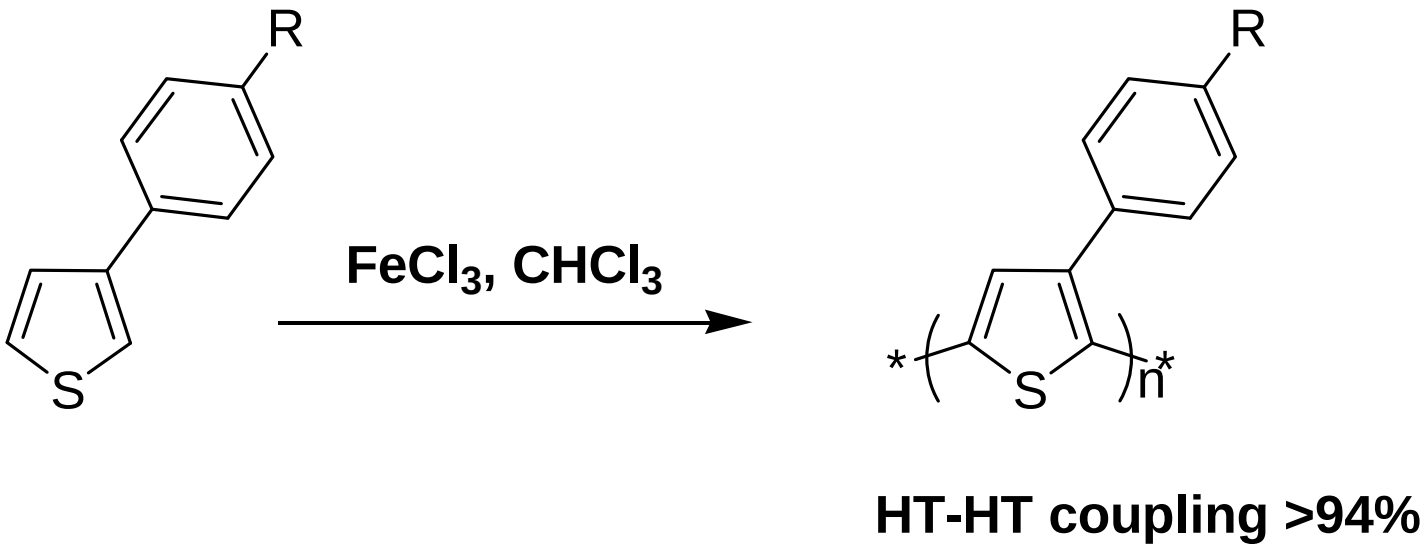
Introduction to Organic Electronic and Optoelectronic Materials and Devices (Eds. Sun & Dalton) CRC Press, 2008. ISBN-10: 0849392845



Scheme 6.6 Synthesis of HT-HT PTs by the Stille reaction (a) & Suzuki reaction (b).

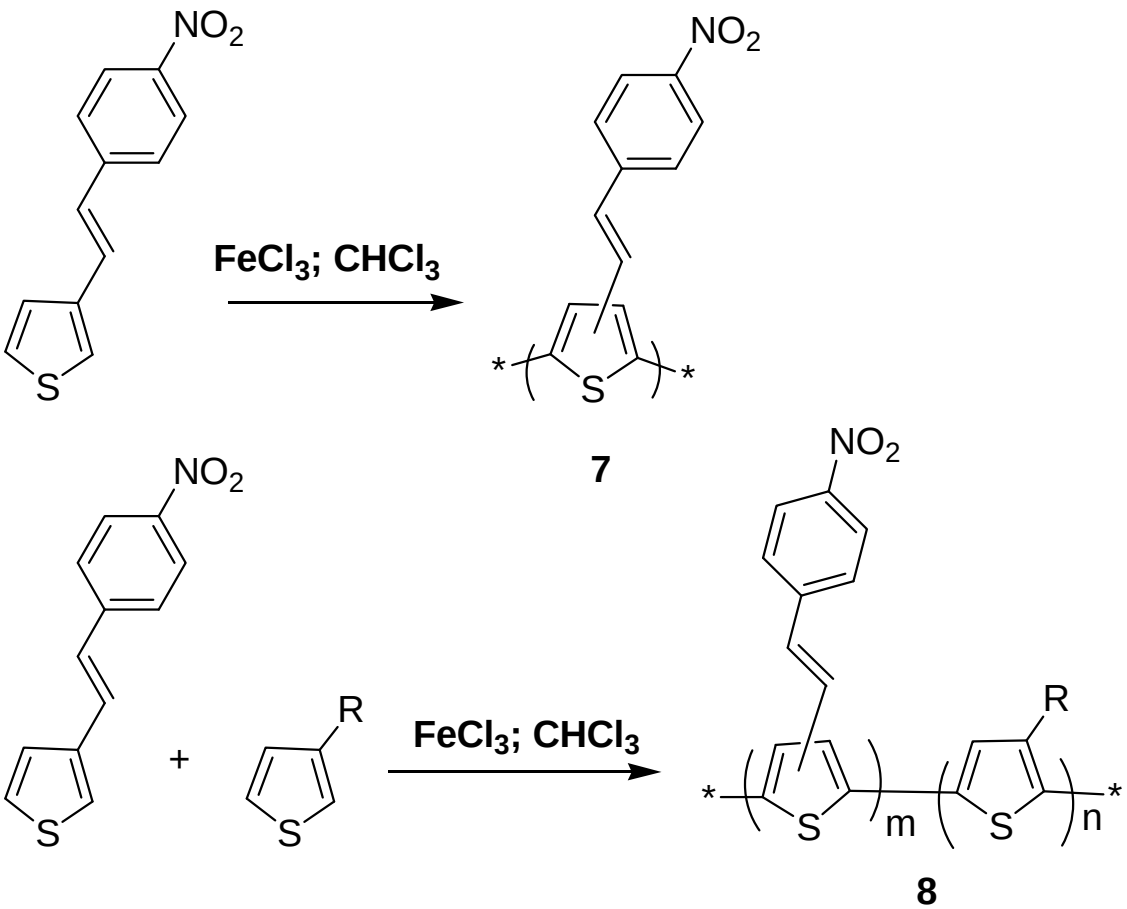


Scheme 6.7 Synthesis of P3ATs by Ni(0) catalytic dehalogenation reaction.

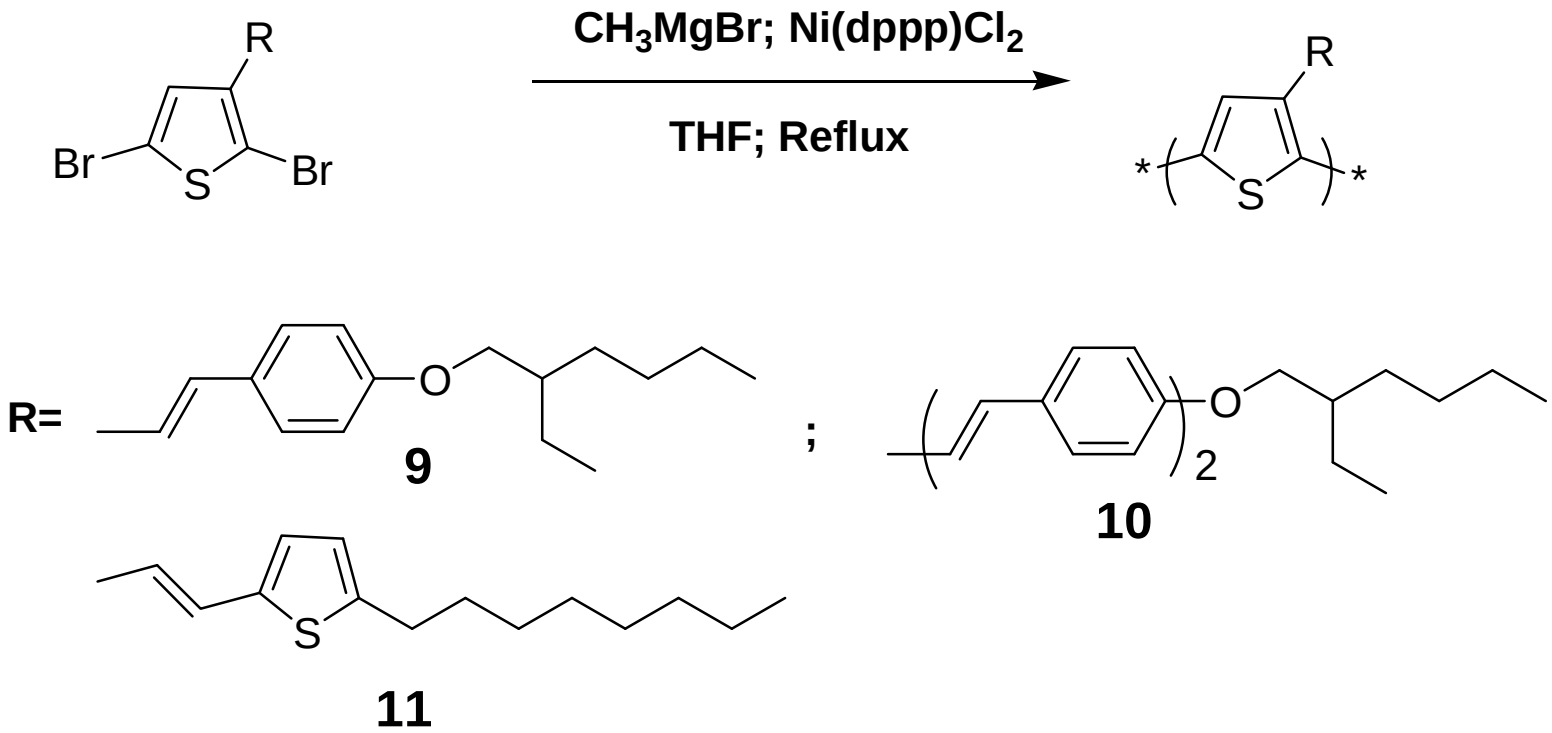


R = —C_8H_{17}-n ; —OC_8H_{17}-n

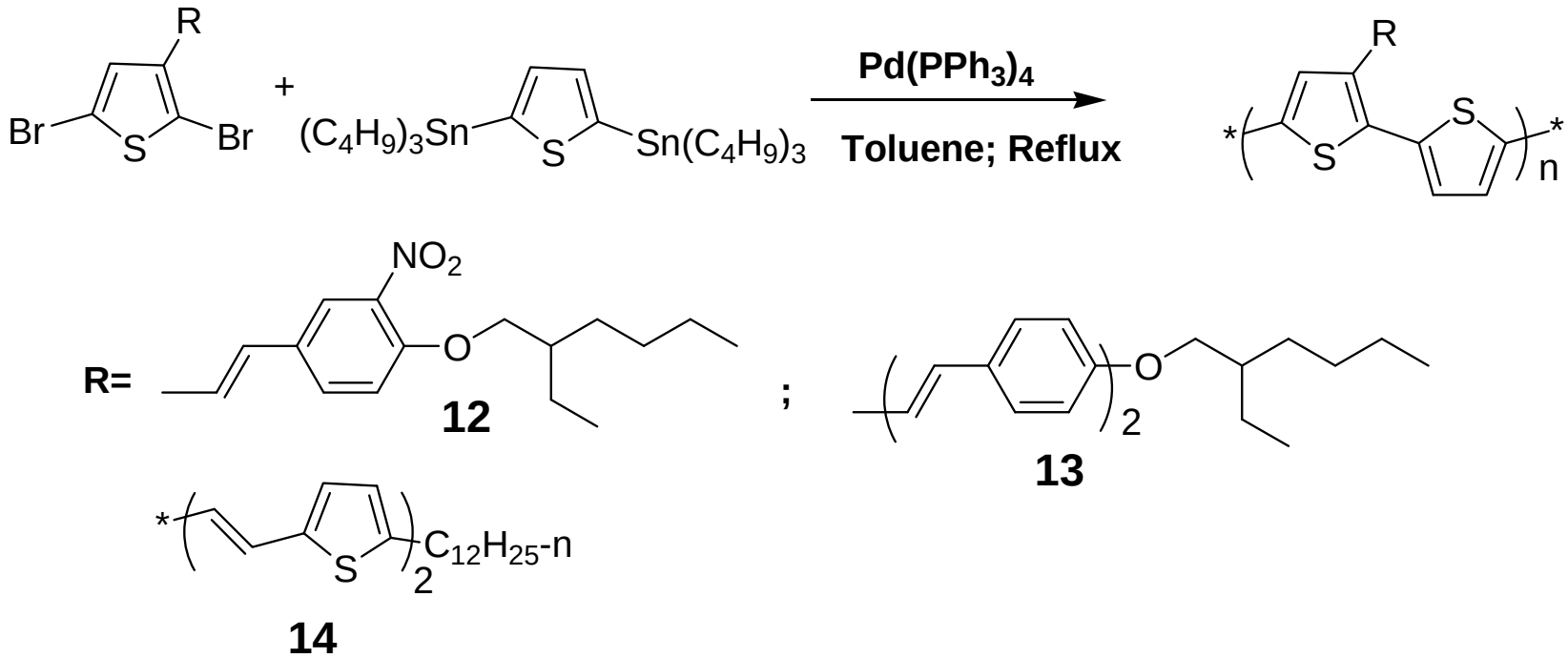
Scheme 6.8 Synthesis of nearly regioregular P3PTs by oxidative polymerization



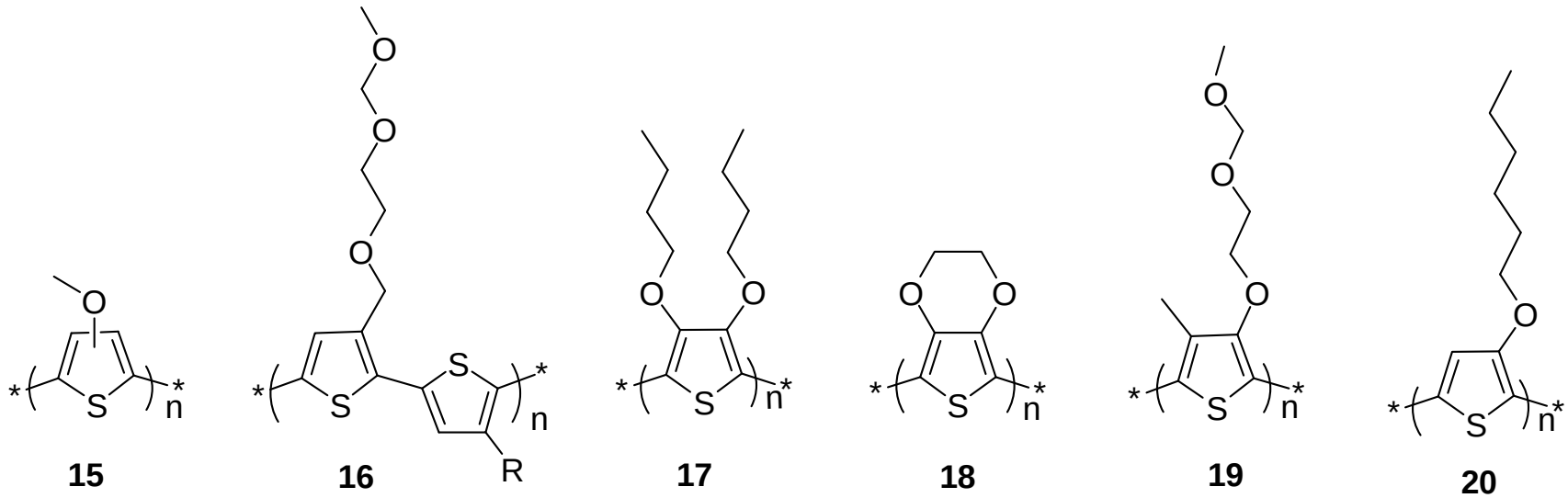
Scheme 6.9 Synthesis of phenylene-vinylene substituted PTs by $FeCl_3$ method.



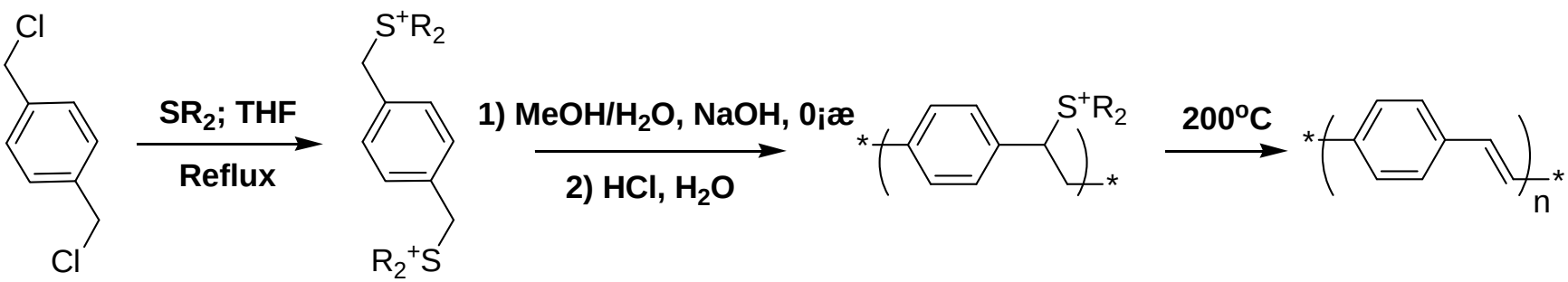
Scheme 6.10 Synthesis of phenylene-vinylene & thienylene-vinylene substituted PTs by the GRIM method.



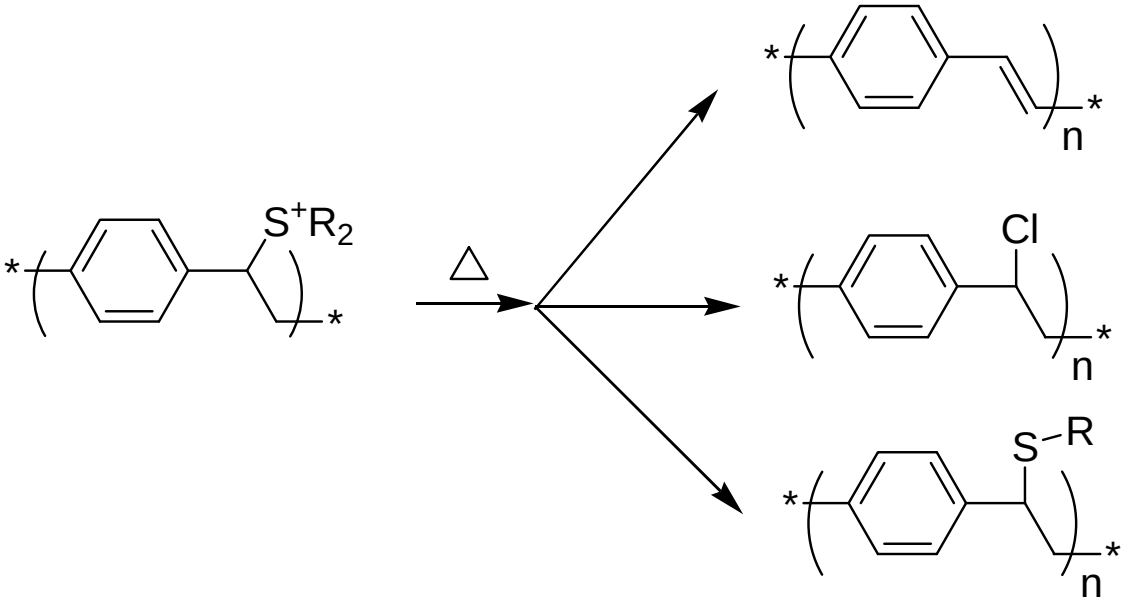
Scheme 6.11 Synthesis of phenylene-vinylene & thienylene-vinylene substituted PTs by the Stille coupling method.



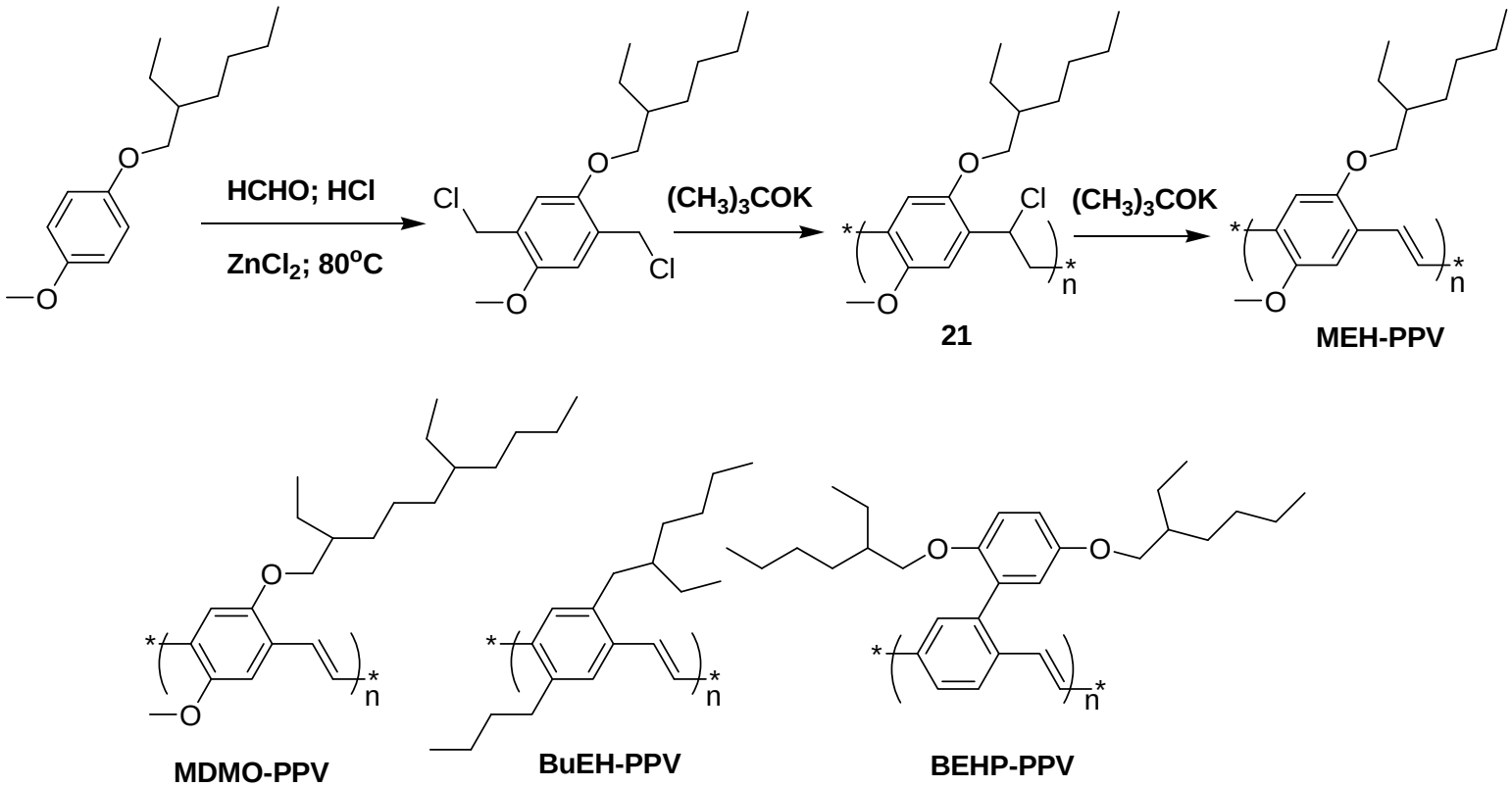
Scheme 6.12 Structure of some poly(alkoxythiophene)s.



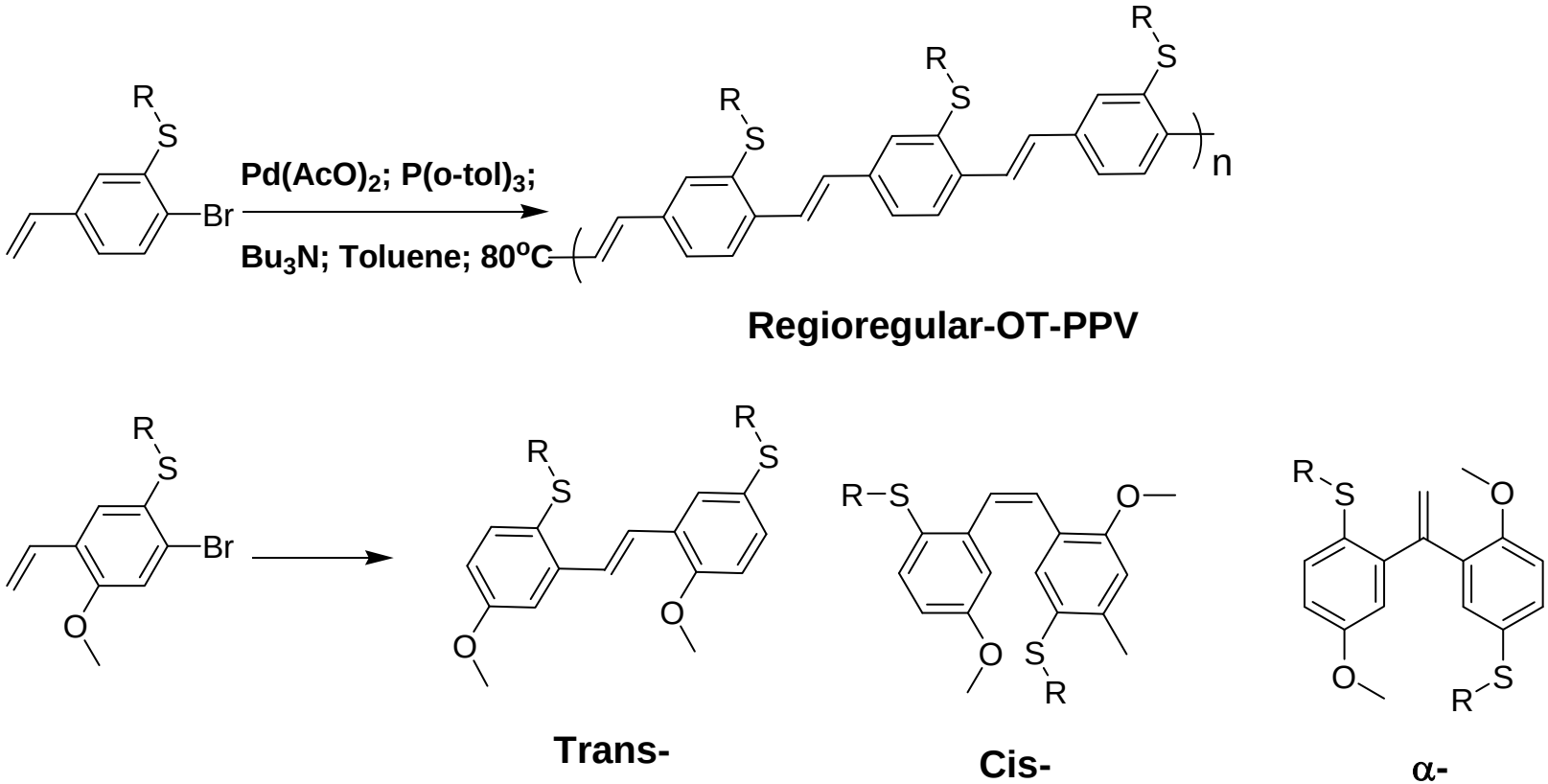
Scheme 6.13 Synthesis of PPV by the Wessling precursor route.



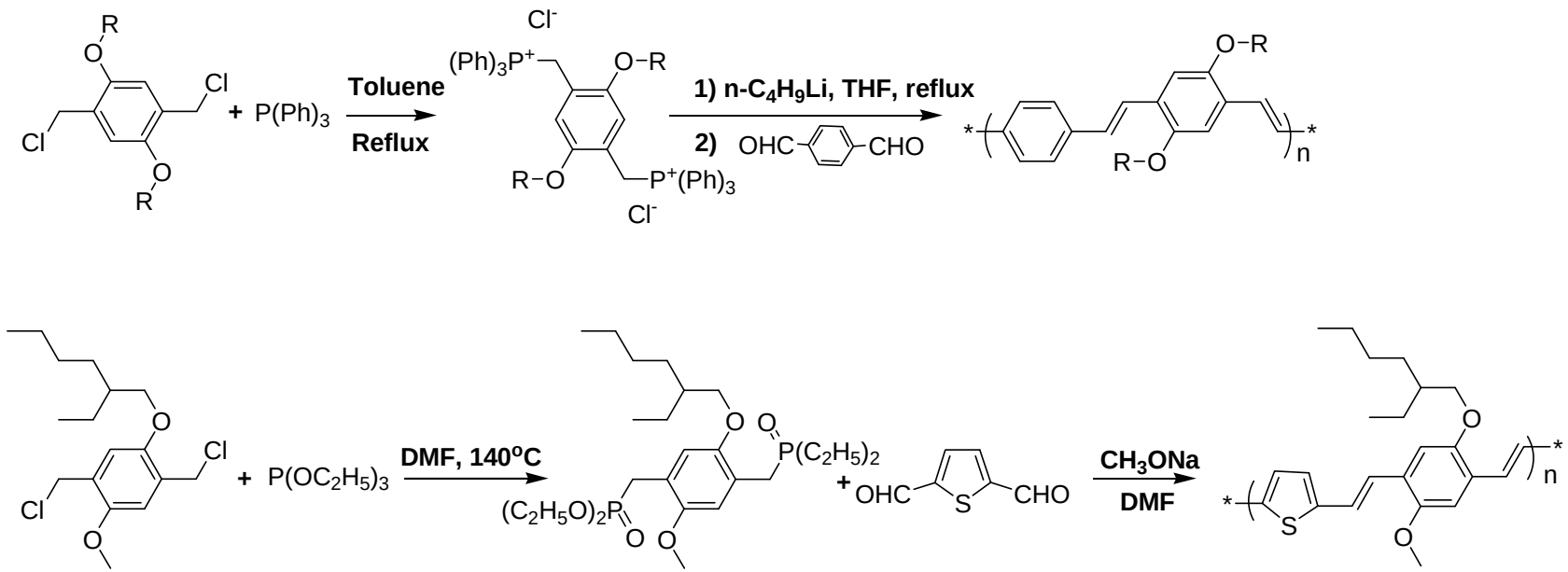
Scheme 6.14 Possible products and defects in the Wessling precursor method.



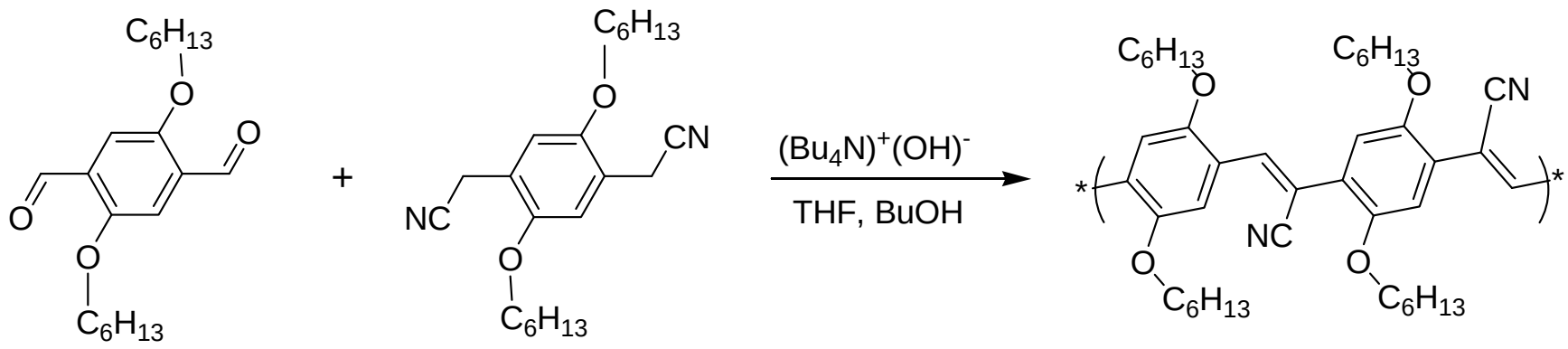
Scheme 6.15 Synthesis of MEH-PPV by the Gilch method and the PPVs that have been synthesized by this method.



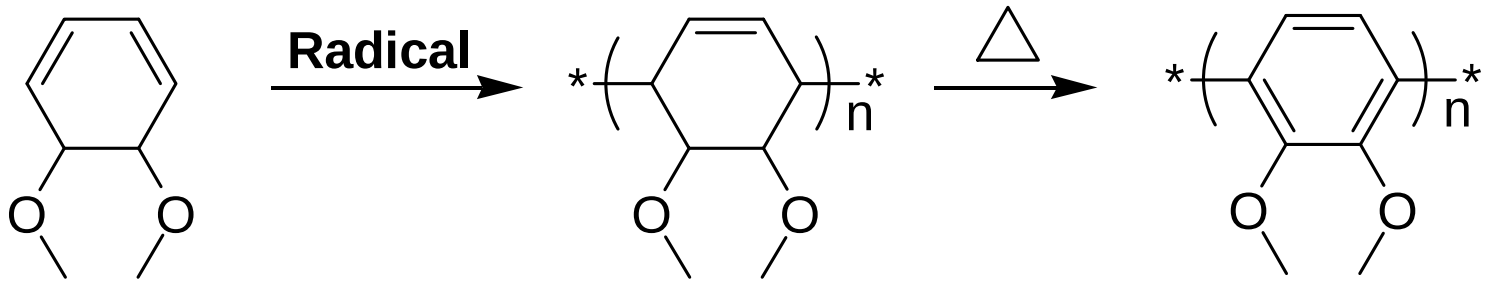
Scheme 6.16 Synthesis of the alkylthio-substituted PPV by the Heck coupling reaction.



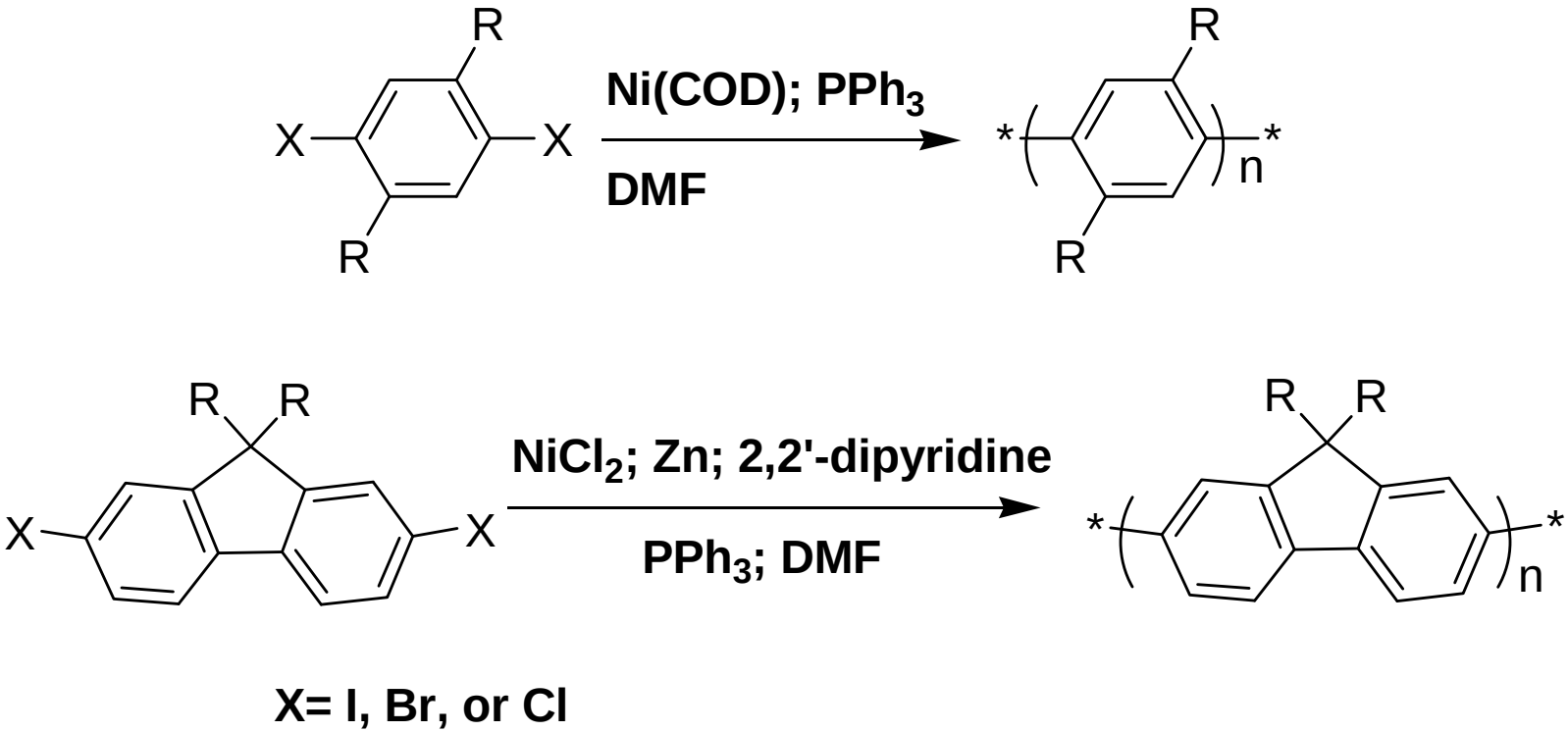
Scheme 6.17 Synthesis of PPV and its derivatives by the Wittig & Hornor-Emmons reactions



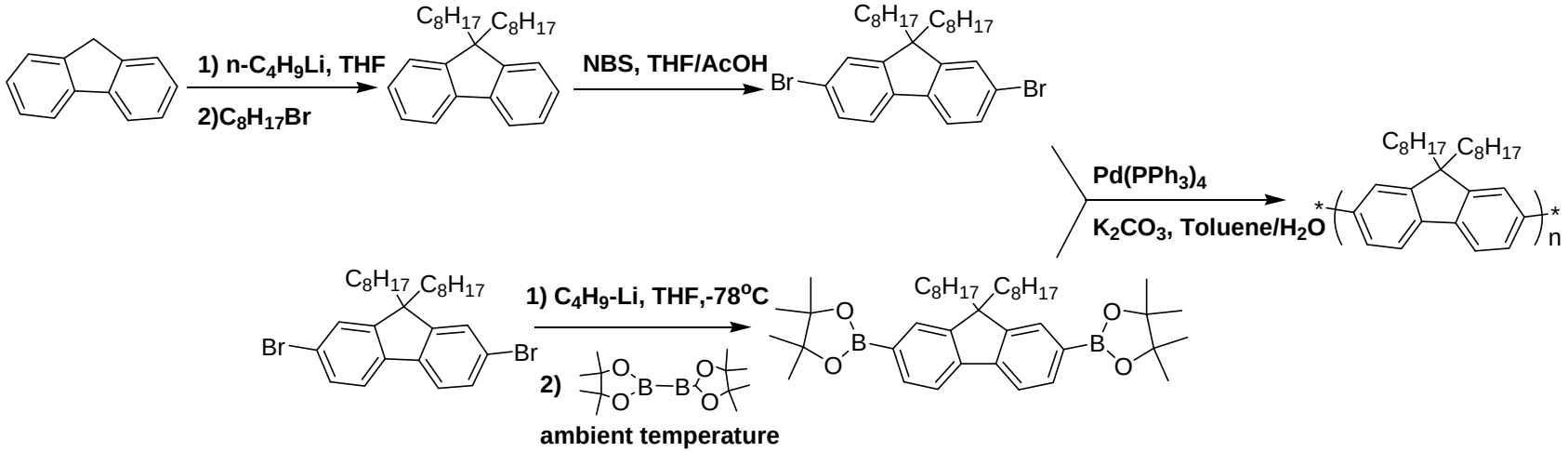
Scheme 6.18 Synthesis of CN-PPV by the Knoevenagel condensation



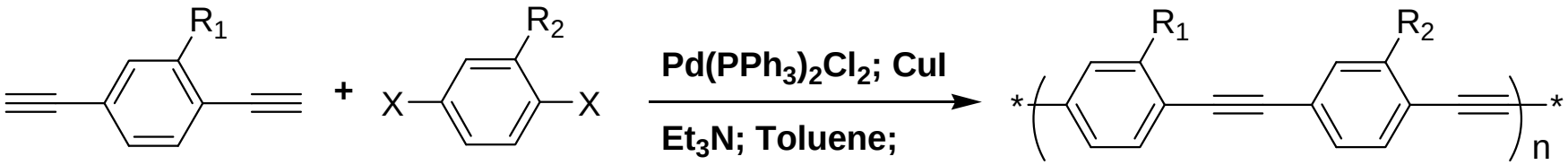
Scheme 6.19 Synthesis of PPP by precursor route.



Scheme 6.20. Synthesis of PPP and PF by Ni(0) catalytic dehalogenation reaction

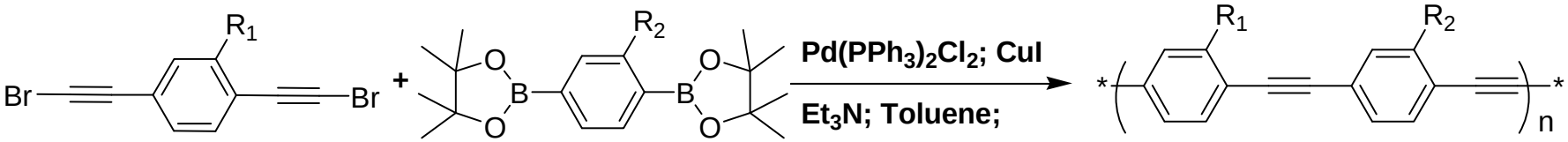


Scheme 6.21 Synthesis of PFs by the Suzuki coupling reaction



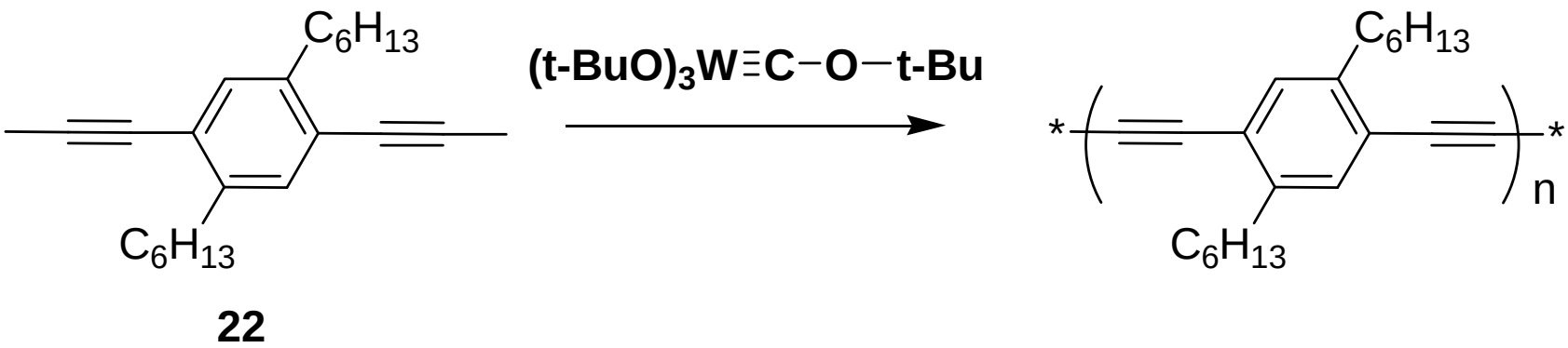
X= Br or I

Scheme 6.22 Synthesis of PPE by the Heck coupling reaction.

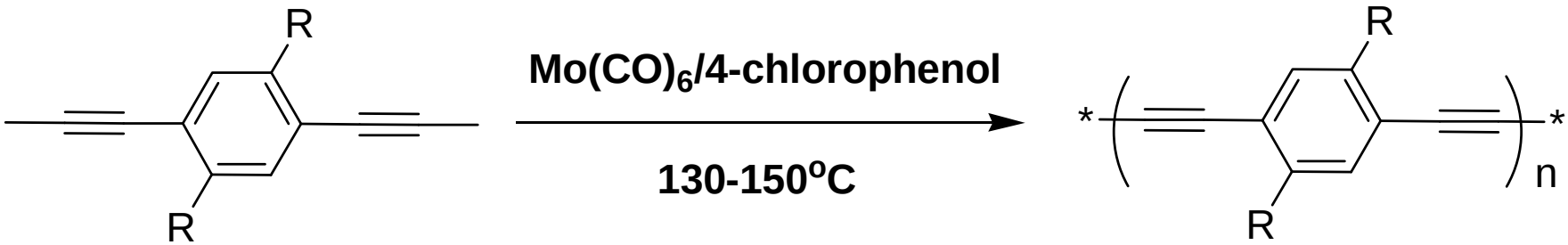


X= Br or I

Scheme 6.23 Synthesis of PPE by the Suzuki coupling reaction.



Scheme 6.24 Synthesis of PPEs by alkyne metathesis



Scheme 6.25 Synthesis of PPEs by alkyne metathesis at a higher temperature