Fundamentals of Chemical and Electrochemical Doping In Conducting Polymers

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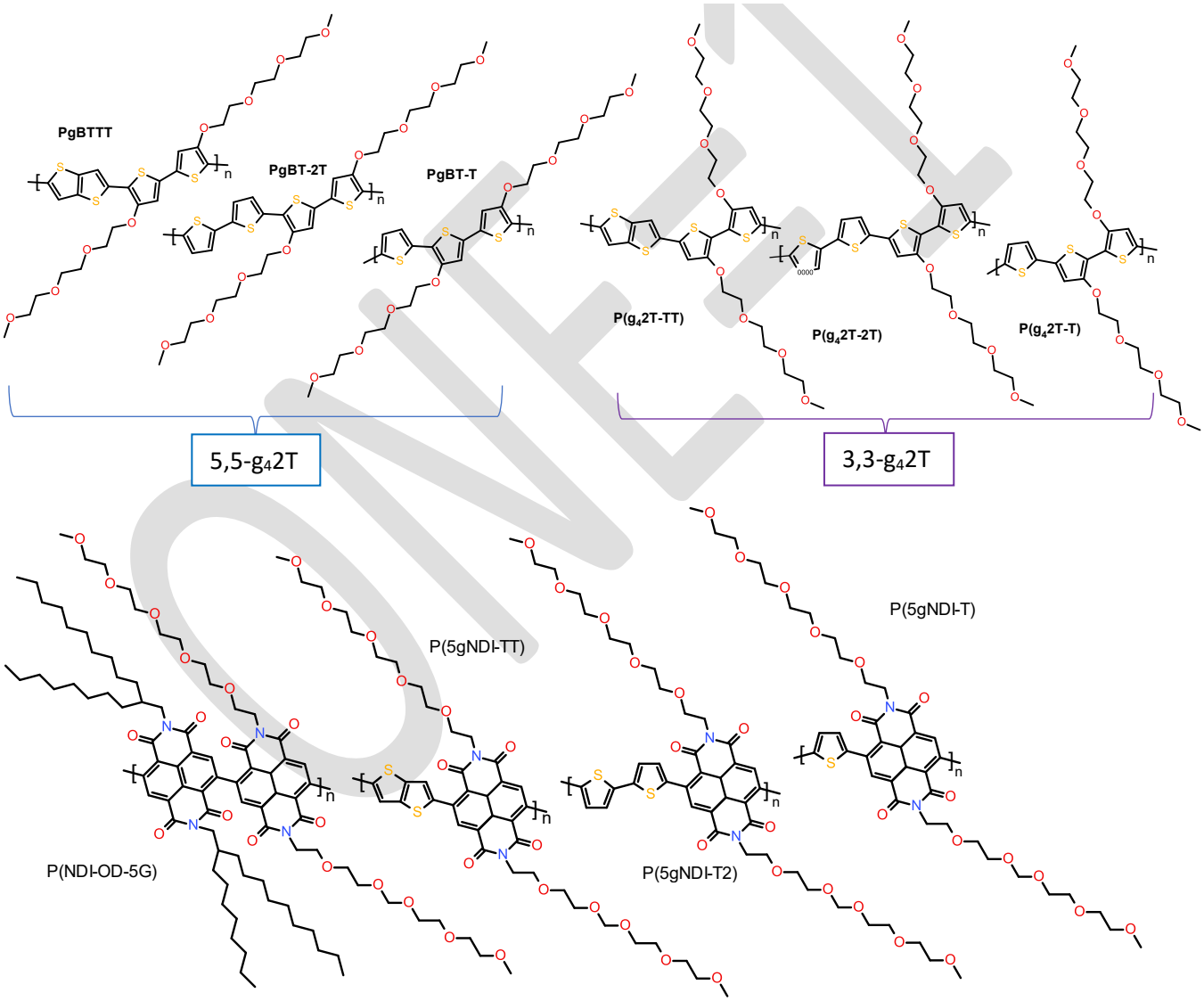
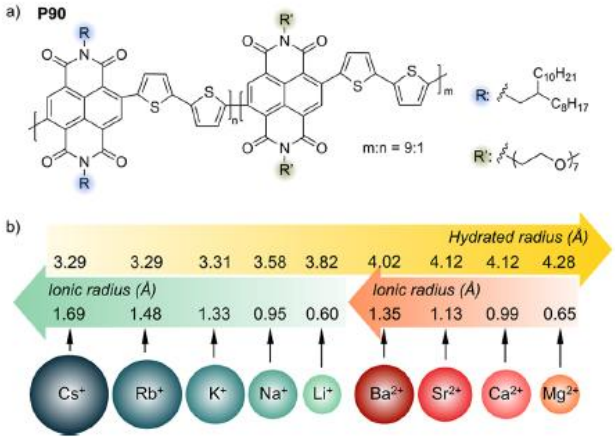
Remarks from the symposium: Various emerging technologies based on organic electronic materials, such as thermoelectrics, bioelectronics, electrochromics, photovoltaics, and neuromorphic computing, rely on improving strategies to dope conjugated polymers. Two major types of doping methods have emerged as powerful ways to modulate the electronic and mechanical properties of conjugated polymers: Chemical doping and electrochemical doping. Although these methods share many similarities in their underlying physical phenomena, chemical and electrochemical doping are often used for different applications. Better integration of the two communities that focus on chemical and electrochemical doping is expected to synergistically advance our fundamental knowledge of doping. 1-Material is proud of supporting this symposium by providing reliable and reproducible organic electronic materials for your research.





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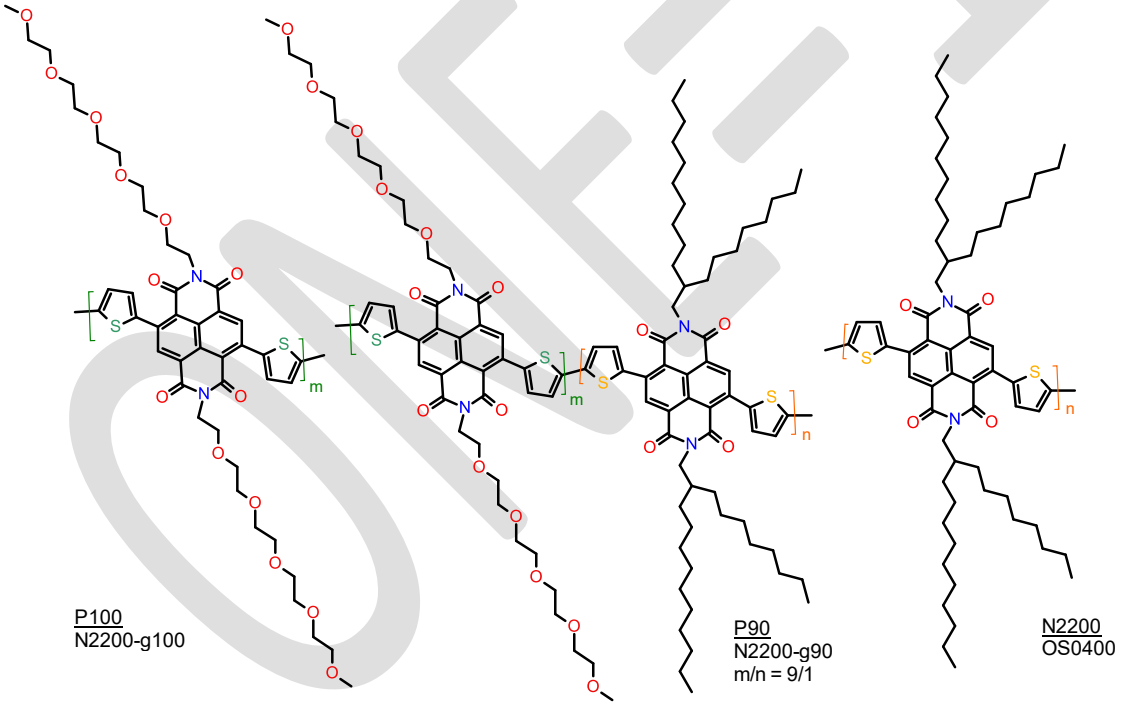
Impact of Cation Insertion on Semiconducting Polymer Thin Films toward Electrochemical Energy Conversion

A detailed investigation of how cation identities govern the redox chemistry of a glycolated N2200 derivative P90 reveals that the glycolated side chains of P90 enhance swelling in polar solvents and change charge distribution on polymer electrodes due to increased dielectric constant and decreased π–π stacking distance of the backbone compared to the alkylated analogue (N2200). The remaining 10% alkyl side chains are necessary to enable higher transconductance in P90-based optoelectronics than polymers with 100% glycolated side chains.



Polymer	P100 (N2200-g100)	P90 (N2200-g90)	N2200 (P00)
Appearance	Greenish black solid	Bluish black solid	Bluish black solid
Typical Mw/Mn (K)	35 /16	40/18	100/40
Solubility ($CHCl_3$)	Excellent	Excellent	Excellent