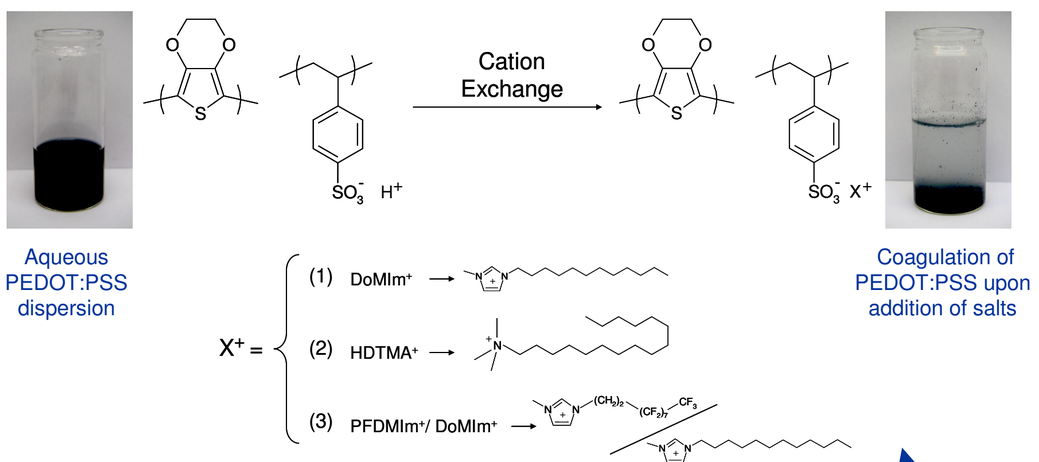
Ion exchange strategies towards new polymers for plastic electronics

Markus Döbbelin, Rebeca Marcilla, Jose A. Pomposo, David Mecerreyes
New Materials Department, CIDETEC, Parque Tecnológico de San Sebastián, Paseo Miramón 196, E-20009 Donostia-San Sebastián,Spain
dmecerreyes@cidetec.es

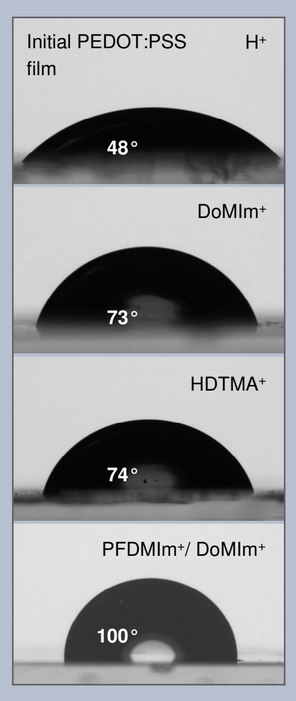
New Approach to Hydrophobic PEDOT:PSS Thin Films[3]

Organic PEDOT:PSS dispersions (DMF, DMSO, methylene chloride, NMP, methanol).

Improvement of water resistance of PEDOT:PSS films.



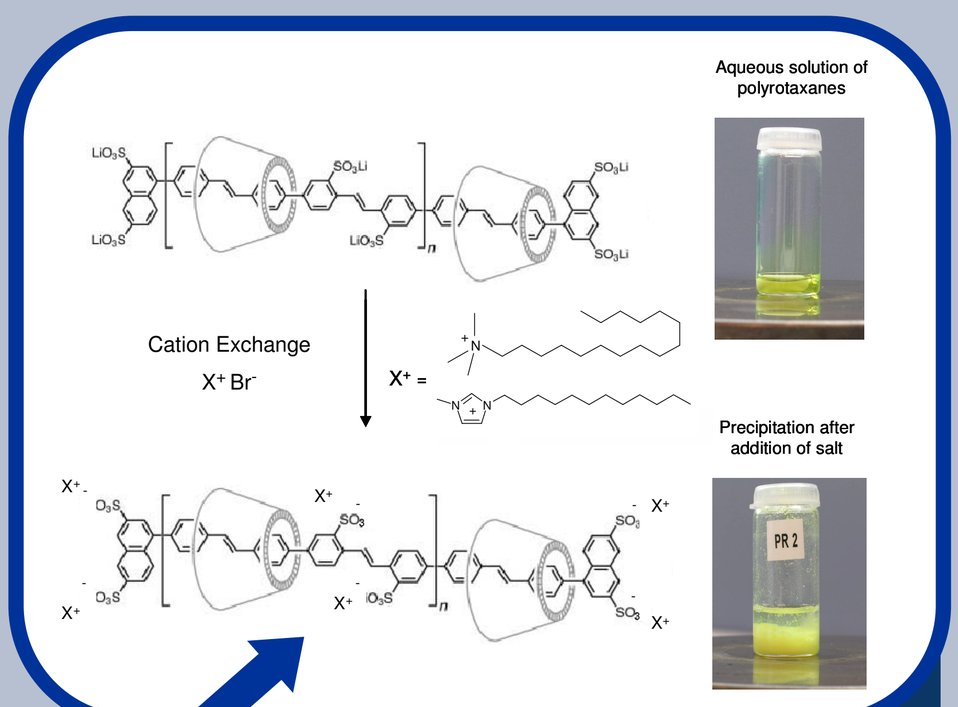
Water contact angles of initial and modified PEDOT:PSS films



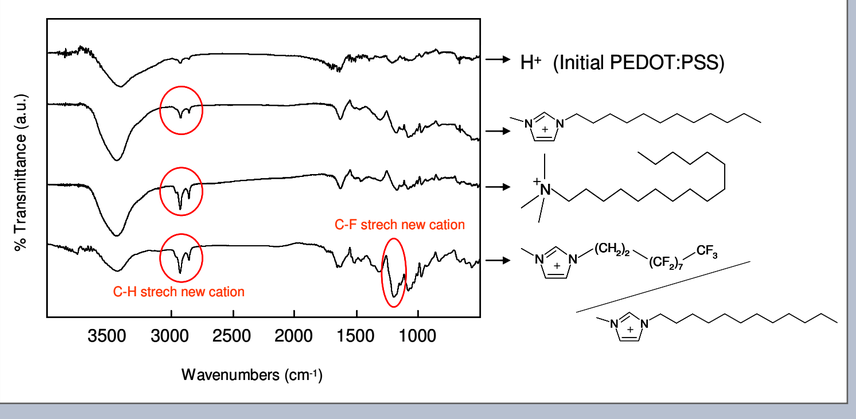
Organic-soluble Polyrotaxanes

The cations with long hydrocarbon chains make polyrotaxanes insoluble in water and the polymer precipitates.

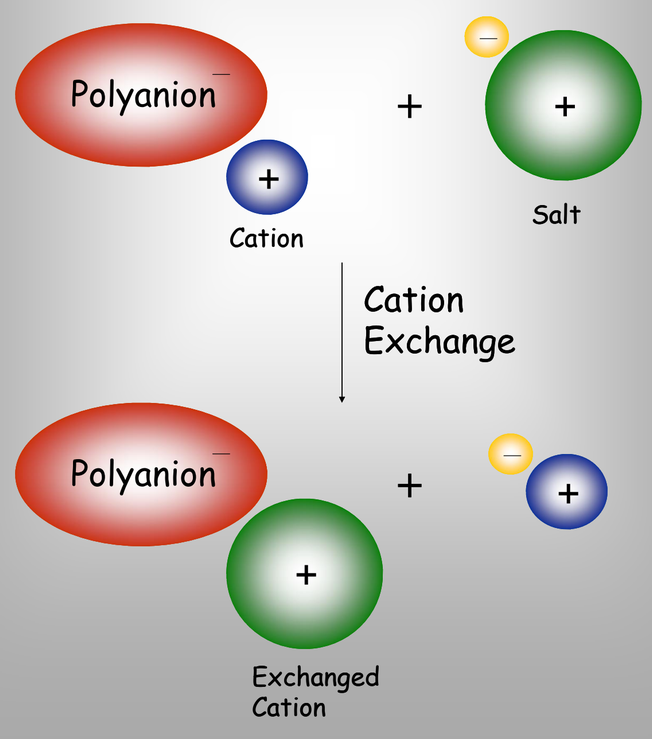
Recovered polyrotaxanes can be dispersed in solvents like DMF, MeOH, DMSO or NMP.



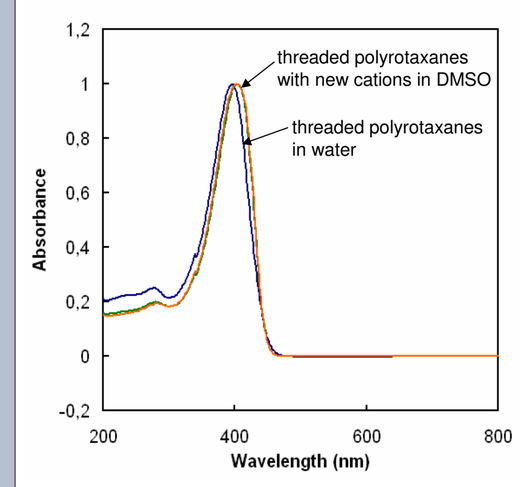
FT-IR spectra of PEDOT:PSS with different counter-ions and corresponding bands



Ion Exchange Reactions provide an effective strategy to tune properties of polyelectrolyte polymers. Physico-chemical properties like wettability, solubility, thermal or electrical properties can be easily modified.[1,2]



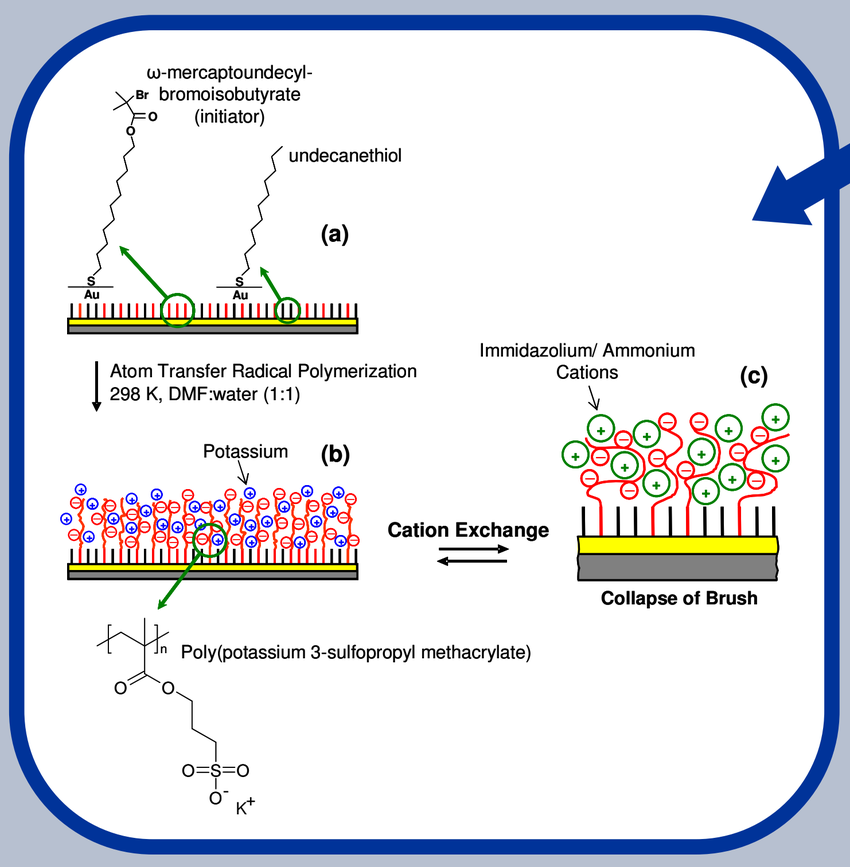
UV/Vis spectra of polyrotaxanes

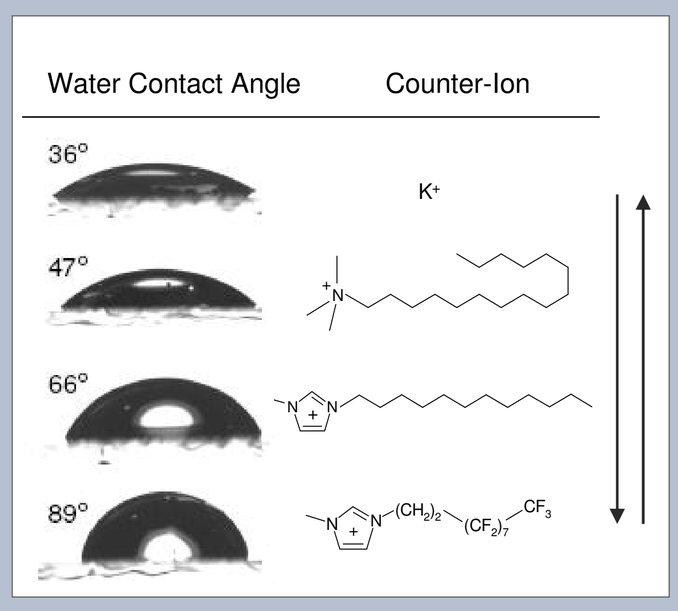


The typical absorbance of polyrotaxanes at around 400 nm is slightly shifted in the organic dispersions. This is probably due to the new solvent.

Smart surfaces[4]

Cation responsive poly(potassium 3-sulfopropyl methacrylate) (PSPM) brushes can be reversibly switched from hydrophilic to hydrophobic.





References:
[1] (a) Marcilla, R.; Blazquez, J. A.; Fernandez, R.; Grande, H.; Pomposo, J. A.; Mecerreyes, D. *Macromol. Chem. Phys.* **2005**, 206 (2), 299.
(b) Marcilla, R.; Blazquez, J. A.; Rodríguez, J.; Pomposo, J. A.; Mecerreyes, D. *J. Polym. Sci., Part A: Polym. Chem.* **2004**, 42, 208.
[2] Weijtens, C. H. L.; Van Elsbergen, V.; De Kok, M. M.; De Winter, S. H. P. M. *Org. Electron.* **2005**, 6, 97.
[3] Manuscript in preparation
[4] Döbbelin, M.; Arias, G.; Loinaz, I.; Llarena, I.; Mecerreyes, D.; Moya, S. *Macromol. Rapid Commun.* **2008**, in press.

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