COLOR TUNING OF ELECTROCHROMIC HETEROPHENOQUINONES

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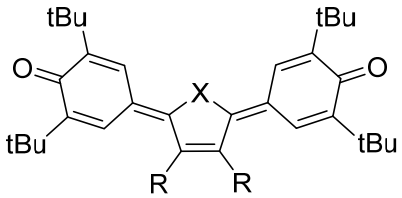
Electrochromic materials have aroused great interest in the last decades for their use in sophisticated applications such as color changing glasses[1] and windows[2] (e.g. in aircrafts). Popular organic electrochromes are polythiophenes[3] and viologenes[4].



X = O, S, Se

Insertion of thiophene and related heteroaromatic moieties into oxygen analogues of Chichibabin's hydrocarbon[5] resulted in a new class of EC materials: electrochromic heterophenoquinones. In contrast to polymeric materials these small molecules can be readily purified and characterized in all occurring redox states (radical anion, dianion). At the same time, color tuning is easily achieved by three means: 1) Exchange of heteroatom (X=O, S, Se), 2) substitution of the heteroaromatic moiety and 3) oxidation of the heteroatom (for X = S, Se).

The materials cover the entire color spectrum and their good solubility allows blending to achieve the desired intermediate colors. Electrochromic devices were fabricated with different architectures (glass, PET substrates) and their switching properties and spectroelectrochemical properties are presented in this work.

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