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Potential-driven On/Off Switch Strategy for the Electrosynthesis of [7]Helicene-derived Polymers

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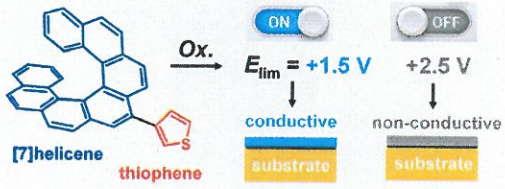
The combination of chirality and an extended π-conjugated system makes helicenes and their derivatives promising materials for circularly polarized luminescence devices, novel sensing technologies and chiral separation applications. Linking helicenes with intrinsically conductive, semiconductive or redox active polymers or introduction of functional groups modulating their physicochemical properties such as conductivity, solubility etc. can produce new materials. Therefore, this project addresses a highly important aspect of the applicability of helicene-based materials - new materials bearing thiophene and [7]helicene moiety were prepared by a potential-driven on/off switch strategy onto the surface of glassy carbon and indium tin oxide substrates. Specifically, a 3-([7]helicen-9-yl)-thiophene hybrid monomer[1] was electrooxidized in acetonitrile by cyclic voltammetry with anodic potential limits of +1.5 V or +2.5 V, resulting in a conductive and non-conductive polymer, respectively. The electrochemical findings were supplemented by microscopy investigations; UV-Vis, fluorescence and vibrational spectroscopies, ellipsometry measurements and computational chemistry. The electrodeposited polymers could be used for the further development of materials applicable in organic electronics and sensing technologies[2].



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2 Hrbáč, J.; Strašák, T.; Fekete, L.; Ladányi, V.; Pokorný, J.; Bulíř, J.; Krbal, M.; Žádný, J.; Storch, J.; Vacek, J. *ChemElectroChem* **2017**. DOI: 10.1002/celc.201700441.