Redox and ion-exchange properties in surface-tethered DNA-conducting polymers

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Résumé en anglais	A poly(cyclopentadithiophene) matrix modified by DNA covalently fixed to the surface has been designed to study the redox and ion-exchange properties in surface-tethered DNA-conducting polymers. Voltammetric investigations show an improvement in conductivity, originating from DNA modification, probably due to changes in charged-density and size of dopant species. Cyclic voltammetry with concomitant QCM measurements indicate that the mass changes are consistent with an ejection of Na+ cations associated to the anionic phosphate groups, attesting a DNA contribution to the p-doping process. So, in contrast to the classic doping patterns, the p-doping process of surface-tethered DNA-copolymer exhibits a cation-controlled transport mechanism. Impedimetric investigations indicate that for long enough DNA target sequence, nucleic acid preserves certain flexibility and is involved in the p-doping process through a diffusion-like motion. These results give new opportunities for genesensors development and for a better understanding of bioactive conducting surfaces.
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