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Electrochromic and electrochemical sensors based on conjugated polymers doped Prussian blue

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Due to unique physical and chemical properties, conjugated polymers are applied in various areas of technology. Synthesis of π-conjugated polymers and modification of electrodes can be performed in several different ways, the most popular of which are chemical, biochemical and electrochemical methods. The electrochromic effects of electrodes modified with electrochromic materials can be evaluated in addition to electrochemical signals. More advanced overview of electrochromic materials and their application in sensor design can be found in our recent review and in our papers, which report the applicability of the electrochemically deposited conjugated polymers (such as polyaniline (PANI) and azo benzene with 3,4-ethylenedioxythiophene moieties) and even inorganic materials (such as Prussian blue). In this presentation, the performance of several electrochemical and electrochromic sensors based on electrochemically deposited π-π conjugated polymers (such as PANI, poly pyrrole and some others) towards the determination of some heavy metal ions, NH_3 and CO_2 will be reported. In present investigation, we have simultaneously studied the electrochemical and electrochromic performances of PANI film before and after the incubation of the PANI/ITO electrode in the solution containing analyte. Two potential steps based on pulse profile have been applied in order to generate chronoamperometric and electro chromic responses of the PANI/ITO electrodes in this investigation.

Recent Publications

1. **Celiesiute R, Ramanaviciene A, Gicevicius M and Ramanavicius A (2018) Electro chromic sensors based on conducting polymers, metal oxides and coordination complexes. Critical Reviews in Analytical Chemistry 1-14.**
2. **Gicevičius M, Bagdziunas G, Abduloglu Y, Gumusay O, Soganci T, Ramanaviciene A, Ak M and Ramanavicius A (2018) Experimental and theoretical investigations of the electrochromic azobenzene and 3, 4-ethylenedioxythiophene-based electrochemically formed polymeric semiconductor. ChemPhysChem 19(20):2735-2740.**
3. **Virbickas P, Valiūnienė A and Ramanavičius A (2018) Towards electrochromic ammonium ion sensors. Electrochemistry Communications 94:41-44.**
4. **Gicevicius M, Celiesiute R, Kucinski J, Ramanaviciene A, Bagdziunas G and Ramanavicius A (2018) Analytical evaluation of optical pH-sensitivity of polyaniline layer electrochemically deposited on ITO electrode. Journal of Electrochemical Society 165(14):H903-H907.**
5. **Deshmukh M A, Gicevicius M, Ramanaviciene A, Shirsat M D, Viter R and Ramanavicius A (2017) Hybrid electrochemical/ electrochromic Cu(II) ion sensor prototype based on PANI/ITO-electrode. Sensors and Actuators B Chemical 248:527-535.**

Biography

Arunas Ramanavicius is a Professor at Vilnius University, Lithuania. He is a Head of Department of Physical Chemistry at Vilnius University and Nanotechnas-Centre of Nanotechnology and Materials Science. He is also leading the Department of Nano Biotechnology at Research Center of Physical Sciences and Technologies. He is a Member of Lithuanian Academy of sciences. He has completed his PhD and Doctor Habilitus degree at Vilnius University in 1998 and 2002, respectively. He is serving as Expert-Evaluator in EU-FP7 program coordinated by European Commission and he is a Technical Advisor of many foundations located in European and Non-European countries. He has research interests in various aspects of nanotechnology, bio-nanotechnology, nanomaterials, biosensorics, bioelectronics, biofuel cells and MEMS based analytical devices. He is a National Coordinator of several nanotechnology related COST actions.

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