

Application of simultaneous monitoring of the in situ impedance and optical changes on the redox transformation of two polythiophenes: Direct evidence for their non-identical conductance–charge carrier correlation, Toth PS, Peintler-Krivan E, Visy C, ELECTROCHEMISTRY COMMUNICATIONS, 12 (2010) 958-961.

Abstract

The redox transformation of poly(3,4-ethylenedioxythiophene) (PEDOT) and poly(3-octylthiophene) (POT) has been studied and compared by combining simultaneous in situ UV–Vis–NIR spectroelectrochemical and ac impedance techniques. Simultaneous changes of the conductance and the rate of the absorbance increase/decrease of the optically different charge carriers in the selfsame film gave direct and unquestionable evidence for that in PEDOT synthesised in aqueous solution the mono-cationic, while in POT the di-cationic segments are primarily responsible for the development of the name-giving property of conducting polymers. This difference in the role of the charge carriers could be partially observed between PEDOTs prepared in aqueous and acetonitrile (AN) solutions.