



Quo Vadis Chemie

Nanomaterial and Polymer-Modified Electrodes Prepared in Deep Eutectic Solvents for Sensors and Biosensors



which will be delivered by

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Abstract: Deep eutectic solvents (DES) are becoming recognised as interesting alternatives to room temperature ionic liquids and to non-aqueous solvents, with applications in polymer science, metal electrodeposition and nanomaterials, with a few recent applications in sensors. DES synthesis is normally done by simple direct mixing of two solid non-toxic components with some heating, eutectic formation usually being due to strong hydrogen bond interactions between a hydrogen bond acceptor, such as choline chloride, and a hydrogen bond donor such as urea, ethylene glycol or glycerol.

Electroactive polymer-modified electrodes have been prepared by electropolymerisation in DES, with acid dopants, on bare or carbon nanotube modified carbon electrodes and have tuned the nanostructure and surface morphology for sensing applications. Polymers include poly(methylene blue), poly(neutral red), poly(brilliant cresyl blue) and poly(brilliant green). The sensor platforms have been constructed and characterised electrochemically and by surface analysis. The enhanced characteristics of the sensors and biosensors for key analytes such as ascorbate and acetaminophen and of species leading to enzyme inhibition are superior to those of the same sensor and biosensor architectures containing polymer films formed in aqueous solution.