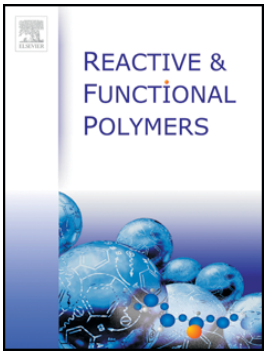

Surface characterization and antimicrobial properties of sodium deoxycholate-based poly(ester ether)urethane ionomer biomaterials

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Surface characterization and antimicrobial properties of sodium deoxycholate-based poly(ester ether)urethane ionomer biomaterials

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Abstract:

New sodium deoxycholate-based poly(ester ether)urethane ionomers have been obtained for the development of biomedical materials. Wettability, surface tension parameters, surface morphology, roughness, water sorption and/or desorption properties, antimicrobial efficiency were determined for the obtained polyurethane biomembranes. Contact angle analysis evidenced that the synthesized polyurethane ionomers are hydrophilic due to orientation and amount of ionic bile salt moieties towards surface. The values of interfacial tension demonstrate biocompatible qualities for these polyurethanes. SEM microphotographs show that the resulted morphologies of polyurethane ionomers are different due to the diverse polyether co-soft segments which determine the supramolecular architecture, ionic interactions between bile salt moiety and polyether segments. AFM images evidence lamellar arrangement at the sub-micron scale and the nanophase separated morphology for these polyurethanes. The estimated moisture diffusion coefficients are dependent on a range of moisture transport mechanisms in the porous membranes and the moisture content of the polyurethanes. The monolayer sorption and average pore size values were estimated by applying BET and GAB models. GAB model could not be applied in case of high water uptake polyurethane samples. The synthesized biocidal polyurethanes are