



# Characterisation of polystyrene coatings after plasma immersion ion implantation and adsorption of protein

S Dekker, A Kondyurin, B Steel, M M M Bilek, D R McKenzie, M James

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A polystyrene film spun onto polished silicon substrates was implanted with either nitrogen or argon ions using plasma immersion ion implantation (PIII) and subsequently investigated by X-ray and neutron reflectometry, UV-VIS and FTIR ellipsometry, as well as by FTIR and Raman spectroscopy. The depth profile of the densified carbon structures resulting from the ion collision cascades in the polystyrene coating are clearly observed by both X-ray and neutron reflectometry. Argon ions produce a higher density modified layer at a shallower depth than nitrogen ions. The thickness measured for these graded layers agrees with the expected depths of ion implantation as calculated by SRIM. The sensitivity of X-ray and neutron reflectometry allows resolution of density and hydrogen content gradients within the graphitized layers. The treated layers were found to covalently immobilized protein directly from solution. The tropoelastin protein monolayers immobilized on the surface were characterized. Tropoelastin remained on the surface after SDS washing.

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