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Comparison of dcMS and HiPIMS Gold Deposition on Polystyrene, Poly-4-vinylpyridine and Polystyrenesulfonicacid

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Gold deposition via high power impuls magnetron sputtering (HiPIMS) allows to coat thin metal layers on heat sensitive materials like polymers allowing increased adhesion compared to an evaporated gold layer. In addition, this particular technique allows deposition at a lower deposited thermal energy in comparison to conventional magnetron sputtering. However, the low temperature nucleation and growth processes of HiPIMS are not sufficiently known. Therefore, we investigate the morphology and structure of thin gold layers on three polymers, namely Polystyrene (PS), Poly-4-vinylpyridine (P4VP) and Polystyrenesulfonicacid (PSS). The polymers are spincoated on silicon to obtain polymer thin films as substrates. These polymers are of interest as they show different functional moieties and thus are expected to influence the growth of the gold layer. We present results of our investigations using atomic force microscopy (AFM), scanning electron microscopy (SEM), grazing incidence small angle X-ray scattering (GISAXS) and grazing incidence wide angle X-ray scattering (GIWAXS).

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