Abstract Submitted for the MAR15 Meeting of The American Physical Society

Smart Hybrids made of Polymer Brushes and Gold Nanospheres STEPHANIE CHRISTAU, FELIX BROSE, TIM MOELLER, RALF KOEHLER, ZULEYHA YENICE, Technical University Berlin, JAN GENZER, North Carolina State University, REGINE VON KLITZING, Technical University Berlin — The modification of surfaces by coating with polymer brushes has attracted much interest in the past few years due to numerous potential applications in material and life science for the development of smart surfaces. They can be used as 3D matrices for the immobilization of nanoparticles, resulting in nanocomposite materials with interesting mechanical, optical, or catalytic properties with tailored functions [1]. Studying the mutual influence of the brush matrix and the attached AuNPs on the structure of the resulting brush/AuNP hybrid will allow fine-tuning of the particle loading and distribution. this study, responsive poly-(N,N-dimethylamino)ethyl methacrylate (PDMAEMA) and poly-(N-isopropylacrylamide) (PNIPAM) brushes are used as a matrix for the attachment of spherical gold nanoparticles (AuNPs). We find that the uptake and distribution of nanoparticles in polymer brush matrices depends greatly on the brush thickness [2], brush grafting density [3], polymer chemistry, particle surface functionalization and particle size. References: [1] S. Christau et al. Z. Phys. Chem., 2014 [2] S. Christau et al. Polymers, 2014, 6, 1877. [3] S. Christau et al. *Langmuir*, 2014, 30, 13033

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Date submitted: 12 Nov 2014 Electronic form version 1.4