

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Exploiting Mixed Self-Assembled Monolayers for Design and Fabrication of Patchy Particles¹ INES PONS-SIEPERMANN, SHARON GLOTZER, Department of Chemical Engineering, University of Michigan — Previous computational studies [1,2] explained the formation of patterns (stripes and patches) in binary mixtures of immiscible surfactants adsorbed on gold nanoparticles [3]. These patterns can confer to the particles unexpected properties, including novel wetting behavior [4]. As an extension of those studies, we performed atomistic and mesoscale simulations of ternary and quaternary mixed self-assembled monolayers (SAMs) on nanosphere surfaces. Here we present predictions for new and unexpected patterns for patchy particles that could be synthesized through judicious choice of surfactant architecture, nanoparticle geometry, and SAM stoichiometry.

[1] C. Singh et al. Physical Review Letters 99, 226106 (2007)

[2] C. Singh et al. Nanoscale 3, 3244-3250 (2011)

[3] A.M. Jackson et al. Nature Materials, 3, 330-336 (2004)

[4] J.J. Kuna et al. Nature Materials, 8, 837-842 (2009)

¹Supported by Defense Threat Reduction Agency Grant HDTRAI-09-1-0012 and James S. McDonnell Foundation 21st Century Science Research Award/Studying Complex Systems.

Ines Pons-Siepermann
Department of Chemical Engineering, University of Michigan

Date submitted: 22 Nov 2011

Electronic form version 1.4