

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Role of hydrophobic interactions in the self-assembly of alternating copolymers¹ CECILE MALARDIER-JUGROOT, ANITA S.W. CHAN, MICHAEL N. GROVES, Royal Military College of Canada — New nanomaterials already play a key role in several emerging technologies. Among the methods used to fabricate new nanomaterials, the most successful in producing precise structure is the bottom-up method. The materials obtained by self-assembly are ordered on different scales and respond and adapt to the presence of other molecules in their environment [1] and can therefore be used as probes, sensors or switches [2]. In this paper, we will describes the self-assembly of amphiphilic alternating copolymers into nanoarchitectures in aqueous solution. To investigate the role of the nature of the hydrophobic groups on the association, the self-assembly of two polymers are compared: poly(isobutylene-alt-maleic anhydride) (IMA) and poly(styrene-alt-maleic anhydride) (SMA) [3, 4]. The theoretical prediction is also compared to experiment and the characterization using Small Angle Neutron Scattering, Dynamic Light Scattering and High Resolution Transmission Electron Microscopy will be presented in detail. [1] S. Zhang, *Nature Biotechnology*, 21, 10, 1171, 2003. [2] F. Patolsky, *et al.*, *Nanomedicine*, 1, 51-65, 2006 [3] C. Malardier-Jugroot, *et al.*, *J. of Phys. Chem. B*, 109(15), 7022-7032, 2005 [4] A.S.W. Chan, *et al.*, *Mol. Sim.*, accepted for publication, 2009.

¹We gratefully acknowledge the support of NSERC(Canada), DGLEPM and Academic Research Program - RMC funding.

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Date submitted: 11 Dec 2009

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