Ordered striped patterns on nanocylinders: A simulation study

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We report computer simulation predictions for the formation of stripe-like patterns in mixed self-assembled monolayers on cylindrical geometries describing nanotubes, nanorods and nanowires. We show that stripes are formed due to a competition between immiscibility and entropic mixing of the two surfactants when they are sufficiently different in length, similar to the patterns formed on nanoparticle [1-3] and flat surfaces [4] reported earlier. We investigate how the degree of curvature affects and patterns, and show that the curvature of a nanocylinder helps to create stripes that are more ordered than those on nanospheres and flat substrates. Patterning nanocylinders in this way provides a strategy for creating "bar coded" and biphasic nanowires using a self-assembly process.

References:
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