Abstract Submitted
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Using multivalency to tailor the superselective binding of polymers on substrates[1] NICHOLAS TITO, DAAN FRENKEL, Department of Chemistry, University of Cambridge, Cambridge CB2 1EW — Multivalency is a microscopic design concept in which a single nanoscopic entity contains multiple ligands, each of which may bind to multiple receptors on another entity. A useful property of many multivalent systems is "superselectivity," where the fraction of the multivalent species bound to their complementary receptors grows sharply with the total number of receptors available. For example in the past two decades, multivalency has been exploited to develop DNA-coated nanoparticles that self-assemble into aggregates over an extremely narrow temperature window. In this talk, we use analytic and self-consistent field theories to explore the binding of multivalent polymers to receptors on a flat substrate. Discussion will focus on how the sequence, number, and binding strength of ligands along the polymer chain can be used to tune the superselectivity of the system. Comparison with recent experiments on model systems will be presented as time permits.

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