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Precise Control of Areal Density of 'Click' Functional Groups on Nanoparticle Surfaces YANIR MAIDENBERG, JEFFREY KOBERSTEIN, Columbia University — Tremendous effort has been invested into devising methods that enable full control of surface functionalities by use of a mixture of two self-assembled monolayers (SAM). By assuming control of the relative amounts of SAM moieties on a surface it is possible to fabricate materials with well-known molecular compositions and, thus, well-characterized properties. This could be achieved by mixing one reactive and another inert modifying agent or by utilizing two agents with complementary properties. These surfaces have shown benefits in various applications ranging from sensing to DNA sequencing. Two methods are performed to control the exact amount of 'click' functionalities on the curved surfaces of silica and iron oxide. The density of alkyne is controlled by mixing two silanes, of which one bears the alkyne functionality, and the other does not. Azide density, however, is controlled in a novel method using the kinetic control of the substitution reaction of bromide to azide on a bromide-terminated silanized surface. We report herein a novel method to quantitatively ascertain no phase separation of the silanes occurred on the curved surface, and that true mixing was achieved. We also show that true mixing of silanes occurs regardless of surface geometry or identity for both systems

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