

Multivalent Interaction of Iron Oxide Nanoparticles with different geometry

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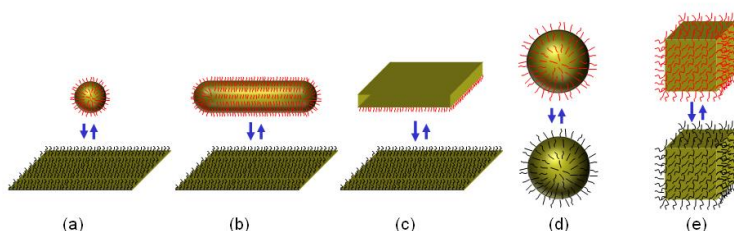
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Multivalent interactions of nanoparticles with different geometries with planar surfaces (a) – (c) or complementary functionalized spherical and cubic (or plate-like) nanoparticles (d) – (e)

Abstract:

The aim of this project is to understand how multivalent functionalized iron oxide nanoparticles interact (1) with each other, (2) with complementary functionalized planar surfaces (see Figure 1), and (3) peptides. Spherical, cubic, rod-like particles as well as prismatic platelets are prepared by wet colloidal chemistry and then functionalized with small ligands complementary to those of other functionalized particles or planar surfaces. The interactions of the particles will be investigated by dynamic light scattering, QCM, or SPR in collaboration with partner groups from the collaborative research center (SFB), including experiments in the presence of a magnetic field. The influence of the surface geometry on multivalent interactions as well as the role of the ligands density will be identified. Later, the concept will be transferred from simple low molecular ligands to more complex biomolecules. Complementary experiments with proteins as an example for an extremely soft binding partner will be carried out together with collaboration partners from the SFB.