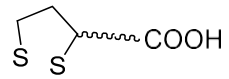
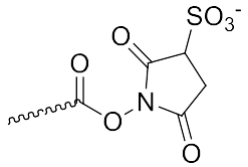
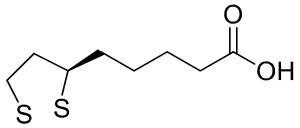
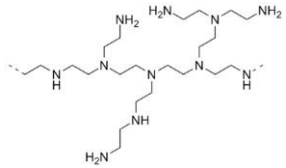
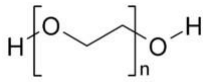
Stratech

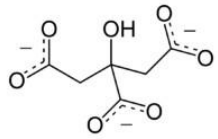
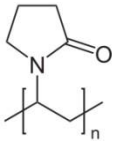
nanoComposix

Surface Matters

Surface/ Solvent or Buffer	Structure	Description	Zeta Potential at pH 7	Salt Stability	Solvent Compatibility
Carbonate	CO_3^-	• Most easily displaced surface • Ideal pH (8-9) and low salt buffer for physisorping antibodies	Negative	Low	Water
PEG carboxyl		• Mixed discrete PEG monolayer with dithiol PEG molecules proximal to the gold and OMe and COOH groups distal • COOH groups provide functionality for covalent coupling • Stable from pH 4-10 and up to 2X PBS buffer	Negative	High	Water
PEG-Sulfo-NHS		• Dried Redispersable powder • Amine reactive surface • Easiest way to covalently bind an amine containing molecule such as an antibody to the surface of the gold particle.	n/a	High	Water
Lipoic Acid/ Water		• Dithiol forms a strong, stable bond with metal surfaces and the acid provides a highly negatively charged surface	Highly Negative	Moderate	Water
Branched Polyethyleneimine (BPEI)/ Water		• Highly aminated, positively charged organic surface coating • Large number of free amines for conjugation to targeting molecules	Highly Positive	Moderate	Water
Polyethylene Glycol (PEG)/ Water		• Provides excellent dispersibility in water and protic solvents and increases compatibility in biological systems • Custom variants available with PEG of different molecular weights and free functional groups for labeling or conjugation	Neutral	High	Water Alcohols Polar Organics
Silica/ Water	**Si-OH**	• Increased particle stability in a wide range of solvents • Versatile conjugation surface for attaching functional groups or creating hydrophobic or fluorphillic surfaces • Nanoporous structure allows low molecular weight molecules to be loaded into the shell.	Negative	High	Water Alcohols

Stratech

nanoComposix

Surface/ Solvent or Buffer	Structure	Description	Zeta Potential at pH 7	Salt Stability	Solvent Compatibility
Amine-Functionalized Silica/ Acetate buffer	$Si\text{-}NH_2$	• Positively charged silica colloids and silica-coated nanoparticles • Useful for binding studies, conjugation with carboxyl-containing molecules through EDAC coupling, or binding to dyes and molecules with isothiocyanate (ITC) or amine-reactive esters	Highly Positive	High	Water Alcohols
Other Functionalized Silica	Si-SH Si-COOH $Si\text{-}C_nH_m$ $Si\text{-}C_nF_m$	• Many custom coatings are available to provide specific functionality at the particle surface or create particles compatible with different solvents or composites	Varies	Varies	Varies
Dodecanethiol / Hexanes		• Hydrophobic coating renders particles soluble in organic solvents and compatible with non-polar polymer composite materials • Can be dispersed in low surface-energy solvents for coating applications requiring uniform particle deposition	n/a	n/a	Polar and Nonpolar Organics
Citrate/ 2 mM Citrate		• Most commonly requested capping agent • Easily displaceable with other molecules for binding studies or custom functionalization • High degree of electrostatic stabilization	Highly Negative	Low	Water
Polyvinylpyrrolidone (PVP)/ Water		• Binds very strongly to metal surfaces, giving excellent colloidal stability over a wide range of conditions • Nanoparticles can be dispersed in a wide variety of protic and aprotic polar solvents • Particles are most stable in high ionic strength solutions and at high concentrations	Negative	Moderate	Water Alcohols Polar Organics