

# Nanoparticles technology for energy, environment and nanomedicine

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The large-scale production of engineered nanoparticles is largely restricted to high temperature processes that preclude the presence of a molecular protecting layer thus generating nanoparticles with quite reactive surface, prone to aggregation and difficult to re-disperse. In addition, the high surface activity also leads to uncontrolled reactions and formation, for example, of a molecular corona when in contact with biomolecules and biological fluids. All those problems can be overcome when chemical production processes of dispersible nanoparticles are considered in conjunction with the development of mild functionalization processes for conjugation of different types of molecules, biomolecules and catalysts/photocatalysts on the surface, while maintaining the colloidal stability. Here we report on one of such chemical approach for efficient large-scale production, creating wide new roads for the development of functional hybrid nanomaterials and nanocomposites suitable for application in areas as diverse as energy, environment and nanomedicine.

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