

Controlled plasma processing of carbon nanostructures and metallic particles in view of use in applications

Gheorghe Dinescu

Plasma Processes, Materials and Surfaces Group, Low Temperature Plasma Physics Laboratory, National Institute for Lasers, Plasma and Radiation Physics, Magurele, Bucharest, Romania

Nanostructured materials have a wide range of applications in energy storage, biomedicine, catalysis, environmental preservation, and sensing technologies. We present plasma approaches, for preparing materials with properties well-defined for specific applicative tasks. We focus on the methods which allow the tailoring of morphology, microstructure, chemical composition of carbon nanowalls, carbon nanotubes, and metallic particles, or their integration in hybrid 3D architectures. We illustrate the utility of such techniques and materials for supercapacitors and batteries, preparation of superhydrophobic or superhydrophilic surfaces, platforms for control of cells growth, decreasing wear in mechanical devices, enhanced recombination surfaces for radicals, and for nuclear fusion related studies.