

NanoLab Talk

Tuesday, February 6th, 2018 – 15.00

Seminar Room

Department of Energy – Cesnef (Building 19) via Ponzio 34/3 Milano
Politecnico di Milano - Italy

“Cluster-assembled carbon materials (and devices) for sustainable energy applications”

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Abstract:

The fabrication of nanostructured materials by the direct deposition of nanoparticles from the gas-phase enables the nano- and micro-manufacturing of complex systems with functional capabilities. Among different methods the assembling of gas-phase clusters and nanoparticles produced in a Pulsed Microplasma Cluster Source (PMCS) and deposited by Supersonic Cluster Beam Deposition (SCBD) is a versatile approach that allows the growth of nanostructured materials with controlled physico-chemical properties and their integration into microfabricated devices. Here we present the SCBD/PMCS synthesis of cluster-assembled carbon thin films and nanocomposites where the structural properties are determined not only by the characteristics of the clusters produced in the gas-phase but also by their organization upon deposition. As prepared carbon-based materials typically present very low density, high surface roughness and large porosity that are promising for the fabrication of electrochemical devices for sustainable energy technologies, such as electrolyte-gated transistors, supercapacitors and photocatalytic systems.

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