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Noble metal nanostructures

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An ongoing objective in the field of nanotechnology is to create specific nanostructures by precisely engineering their physico-chemical properties such as size, shape, charge, aqua-phobicity/philicity and chemical reactivity. The distinctive properties of noble metal perpetually inspire people, leading to new and unpredictable applications. Several scientific efforts were already concentrated to achieve structures of noble metal with new optical values while preserving the electrical and thermal conductivity. In this context, the chemical and electrochemical synthesis of the sensing active metallic colloids in aqueous and non-aqueous media, and also their characterization will be detailed. The obtained noble metal blacks exhibit high purity and are described by a broad absorbance and low reflectance in the ultra violet, visible and in the infrared domain from 200 nm to 20000 nm. X-ray analysis established the purity and crystalline nature. The electron micrographs indicate that the nanostructures consist of crystals that interconnect to form porous assemblies. Particularly, it will be shown how the platinum black thin layer, electrochemically deposited on different metallic and semi-conductive substrates is influenced by the substrate materials. The characteristics of high conductivity, low reflection coupled with high specific surface could confer to the noble metal blacks' value in catalysis and in electronics, predominantly in optical sensors.

Biography

S E Stanca has her expertise in electrochemical and optical nanosensors achieved during her research activity at the EPFL Lausanne (Swiss Confederation Fellow), UCD Dublin (Marie-Curie-Fellow), UKJ Jena (Marie-Curie-Fellow), University Babes-Bolyai Cluj-Napoca, Research Centre Karlsruhe and IPHT Jena (DAAD Fellow). She is currently a Scientist at the Leibniz Institute of Photonic Technology Jena.

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