STSM possibility for 1 PhD student or postdoctoral fellow titled "Synthesis and characterization of nanostructured materials for detection and removal of VOCs from indoor environment"

Title: Synthesis and characterization of nanostructured materials for detection and removal of VOCs from indoor environment

Duration of STSM: 91 days (starting from 1 September 2019).

Place of STSM: Istituto per lo Studio dei Materiali Nanostrutturati (ISMN)-CNR, via Ugo La Malfa, 153, 90146, Palermo (Italy)

Host: Dr. Leonarda Francesca LIOTTA

Short description: The present STSM is devoted to the synthesis and characterization of nanostructured materials, "catalysts", such as Au, Pd, Pt nanoparticles supported over reducible oxides (CeO_2, TiO_2, Fe_2O_3) to be used for chemisorption and catalytic activation of typical VOC molecules. Such "catalysts" represent the active components of typical commercial sensors. It is well known that the performance of supported metal catalysts relies on many factors, including metal particle size, dispersion and metal−support interactions, and differentiation of these effects is challenging in order to get an insight in the operating mode of the catalyst.
The aim of the scientific work at ISMN-CNR of Palermo is to prepare nanostructured materials containing supported Au, Pd, Pt nanoparticles with tailored particle size and metal support interaction with the aim to obtain active components of sensors with high selectivity and enhanced sensitivity with respect to commercial sensors.
The prepared catalytic materials will be characterized in the laboratory of ISMN-CNR (Palermo) by using XRD, Temperature programmed reduction (TPR), XPS, moreover, the textural properties will be determined by specific surface area measurements and porosity. Finally, the catalytic properties in the removal of typical VOCs pollutants will be determined by using probe molecules available in the laboratory, such as propene, toluene, CO (in ppm concentration). Such tests will furnish preliminary data useful to foresee the activity for future detection of typical indoor VOCs of real interest for the purpose of the Cost Action.
In conclusion, the catalytic materials prepared at ISMN-CNR of Palermo can be used as active components for the fabrication of new sensors or can be shared with other partners of the Action in order to test the performance in more realistic conditions.

Interested PhD students/postdoctoral fellows should contact Dr. Leonarda Liotta (leonarda.liotta@ismn.cnr.it) directly.