**ORganic Framework Engineering for VOC sensing in Mesoporous SiO2 films**

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Mesoporous materials emerged as an attractive field of interest due to the unique properties of those materials and the possibility to tailor those as per our needs. This gives the opportunity for broad spectrum of applications in fields such as adsorption, catalysis and sensing.

In this work we examine the properties of SiO2 thin films for application in optical vapors sensing. To do so, thin films are deposited by spin-coating technique. In order to achieve porosity of the films soft-template method is employed via different polymers introduced in different concentrations to generate free volume within the films. The polymers differ in PPG/PEG composition and thus different properties in SiO2 film are achieved. Thicknesses, refractive indices and extinction coefficients of the films are modelled by using nonlinear curve fitting method using the reflection spectra of the films. The free volume fraction in the film is determined by Bruggeman effective medium approximation. Acetone is used as a probing analyte for determination of medium absorption properties. The optical read-out of the films is recorded prior to and after exposure in acetone environment. Implementation of the most sensitive films in Bragg reflectors for VOC sensing are modelled and discussed.

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