

## **Generation of functional mesoporous thin films of binary and ternary metal oxides with crystalline pore walls using novel block copolymer templates and characterization by suitable analytical techniques**

### **COLL 470**

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A general methodology of sol-gel templating is introduced for the generation of thin mesoporous films of various oxides, e.g. for the first time crystalline mesoporous MoO<sub>3</sub>, WO<sub>3</sub> and perovskites. Our approach is based on a novel block copolymer template in combination with suitable processing conditions. The polymer was specially designed, possessing a hydrophilic PEO and a poly(ethylene-co-butylene) hydrophobic block, imposing advanced templating properties in terms of the thermal stability and hydrophilic-hydrophobic contrast. The blocks are long enough to allow for sufficiently thick walls (nanocrystals in the pore walls of at least 5 nm), being compatible with the nucleation of oxide particles without destroying the mesostructure. These optimized templating properties enable the development of facile procedures to obtain crystalline thin films of various oxides. The crystallisation and simultaneous mesostructural changes were studied by In-situ SAXS-WAXS, also by suitable SAXS evaluation techniques to determine pore sizes and wall thicknesses.

#### [Surfactant Self-Assembly](#)

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