

**Thin oxide films with controlled porosity and
nanostructure for photocatalysis, photoelectrics, and
electrochromism**

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Nanocasting and nanocoating are new processes which allow to control the structure of inorganic frameworks by appropriate use of an organic template. The potential choice of templates include organic surfactants, functional polymers, gels, fibres, and prefabricated membranes

It is shown in this talk that a control of structure is enabled over the whole hierarchy of length scales, i.e. accessible architecture parameters include size, composition and mutual arrangement of the nanoparticles, and go over pore architecture and connectivity up to the overall shape of the sample. Especially, high control of binary nanoparticle contacts (nanodiodes and charge separation) as well as the set-up of conducting paths on the nanoscale can be established

This will be exemplified by some nanostructured material hybrids with different high performance application, e.g. a photocatalytic active reaction membrane made of doped titania which decomposes chlorocarbons, a Cu@ZrO_2 system for methanol reforming, or a electrochromic layer based on encapsulated molybdenumoxides.

References

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