

Production of silver oxide nanoparticles with varying degree of oxidation

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By means of reactive magnetron-based sputtering and vapour aggregation we have produced silver oxide nanoparticles in the size range of a few nm. The interaction of silver and oxygen already at the stage of separate atoms—before the onset of nanoparticle formation—enables control of the degree of oxidation. The nanoparticles have been characterized using x-ray photoelectron spectroscopy at the I411 soft x-ray beamline at the synchrotron radiation facility MAX-lab in Lund, Sweden. Taking advantage of this technique's local chemical sensitivity and ability to distinguish the surface from the bulk, we have been able to analyze the particle composition and the chemical state of silver. The demonstrated possibility to produce oxygen-rich clusters with this method may have practical implications in catalysis[1].

References:

[1] B. Hodnett, Heterogeneous Catalytic Oxidation; John Wiley and Sons, Ltd., Chichester, U.K., (2000).