

ZnO nanomaterials with shape anisotropy.

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ZnO has become the most important ceramic semiconductor as it possesses a multitude of advanced properties and applications.^[1] Thus, the fine-tuning of properties of ZnO for particular applications represents an important task. A relatively new method for manipulating the functional properties is the adjustment of particle shape.^[2] Among other factors, the determination of particle shape requires a precise control over the kinetics of nucleation and growth.^[3] Thus it is believed, that the use of molecular precursors is of advantage for the generation of anisotropic metal oxide nanostructures.^[4]

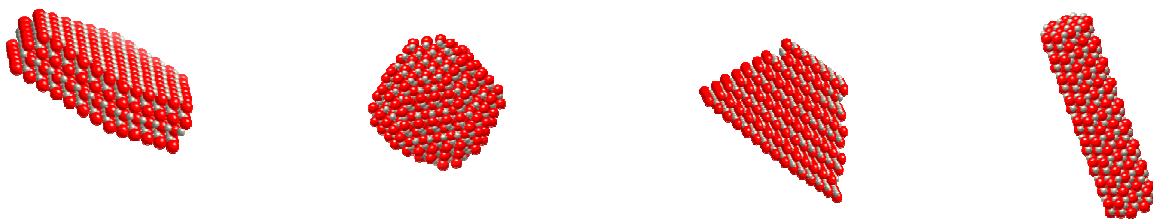


Fig. 1: Schematic images of ZnO nanoparticles with different shape.

Based on our recent in-situ study about the nucleation and growth of ZnO in organic solvents,^[5] here, we present the preparation of ZnO nanomaterials comprising particles of different shape and their application in photocatalysis. The specific interaction of metal cations with the (002) surface of ZnO during particle growth leads to two main effects: (1) An anisotropic growth could be observed. (2) The defect population relates to the ionic radius of the metal cations present at the particle surface.

Both factors influence photocatalytic activity of the materials.

References

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