Low-temperature approach to high surface ZnO nanopowders and a non-aqueous synthesis of ZnO colloids using the single-source precursor $[MeZnOSiMe_3]_4$ and related zinc siloxides

Julia Hambrock[a], Stefan Rabe[b], Klaus Merz[b], Alexander Birkner[c], Andreas Wohlfart[a], Roland A. Fischer*[a] and Matthias Driess*[b]

a) Lehrstuhl für Anorganische Chemie II, Organometallics & Materials Chemistry, Ruhr-University Bochum, D-44780, Bochum, Germany.
E-mail: Roland.Fischer@ruhr-uni-bochum.de
b) Lehrstuhl für Anorganische Chemie I, Cluster and Coordination Chemistry, Ruhr-University Bochum, D-44780, Bochum, Germany.
E-mail: Matthias.Driess@ruhr-uni-bochum.de
c) Lehrstuhl für Physikalische Chemie I, Ruhr-University Bochum, D-44780, Bochum, Germany

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Abstract

We present the temperature-dependent thermolysis of siloxy-substituted ZnO single-source precursors into zinc and zinc oxide, respectively. The solid-state pyrolysis at low temperatures leads to the formation of ZnO powder with a very high surface area whereas the thermolysis in solution yields ZnO colloids. The materials are characterized by UV/VIS, photoluminescence, X-Ray Diffraction (XRD), and Transmission Electron Microscopy (TEM).