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Nanocrystalline ZnO from siloxy-substituted single-source precursors

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Abstract. We report here the synthesis and growth of nanocyrstalline ZnO particles from solid and the CVS of nanoparticles size < 10 nm from siloxy-substituted di-, tri-,tetra- and polynuclear ZnO-clusters. ZnO is of interest for a wide range of applicaticons such as electrodes for solar cells or for electroluminescence devices.

The ZnO-aggregates as molecular precursors are accessible by simple reactions of ZnR'_2 with the respective silanoles R_3SiOH, affording the dimeric $[(Me_3Si)_2NZnOSiR_3]_2$, trinuclear $[(MeZn)_2Zn(OSiR_3)_4]$, tetranuclear heterocubanes $[MeZnOSiR_3]_4$ and the polymeric $[(Me_3SiO)_2Zn]_n$ respectively. Surprisingly, they are useful single-source precursors for low-temperature synthesis of ZnO particles in solid state and through chemical vapor synthesis (CVS).