Review

Non-aqueous Sol-Gel Routes to Metal Oxide Nanocrystals under Solvothermal Conditions: Review and Case Study on Doped Group IV Metal Oxides

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Over the last decade, the number of publications concerning the non-aqueous sol-gel synthesis of metal oxide nanostructures has rapidly increased, as this method affords an immense variety of sizes and shapes of the products. This review highlights the versatility of non-aqueous sol-gel routes, under solvothermal conditions, to metal oxide and hybrid materials. In particular, the easier control over the reaction kinetics, compared to aqueous methods, allows to better match the reactivity between metal oxide precursors. This permits to produce complex multimetal and doped oxides at low temperature, as it is discussed in detail for the case of doped group IV metal oxides.

Key words: Metal Oxides, Nanocrystals, Sol-Gel Process, Solvothermal Synthesis