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| Nota di contenuto | Introduction -- Solution Chemistry; Simple alskoxide based precursor systems; Carboxylate based precursor systems; Single-source precursors; Acqueos Precursor Systems; Solution Synthesis Strategies -- Analytical Methods; Introduction; Thermal Analysis; NMR Sepctroscopy; EXAFS; Other Methods (XRM, SEM,TEM;scattering methods at nanocrystalline films); Spin-Coating; Dip Coating; Inkjet Printing and Other Direct Writing Methods(dip point and imprint techniques); Chemical Bath Deposition; Polymer Assisted Deposition -- Processing and Crystallization; Thermodynamics and Heating Processes; Material Systems Dominated by Heterogeneous Nucleation; |

Material Systems Dominated by Homogeneous Nucleation; Low Temperature Processing; Epitaxial Films; Powder Assisted Film Fabrication; UV-and E-Beam Direct Patterning of Photosensitive CSD Films; Template Controlled Growth -- Functions and Applications; Introduction; Integrated Capacitors; Base Metal Electrodes; Polar Oxide Films for MEMS Applications;Conducting Films and Electrodes; Transparent conducting oxides; Superconducting Films; Porous Films for Gas Sensors; Luminescent Fims -- Appendix; Synthesis for Standard material Systems.

Sommario/riassunto

This is the first text to cover all aspects of solution processed functional oxide thin-films. Chemical Solution Deposition (CSD) comprises all solution based thin- film deposition techniques, which involve chemical reactions of precursors during the formation of the oxide films, i. e. sol-gel type routes, metallo-organic decomposition routes, hybrid routes, etc. While the development of sol-gel type processes for optical coatings on glass by silicon dioxide and titanium dioxide dates from the mid-20th century, the first CSD derived electronic oxide thin films, such as lead zirconate titanate, were prepared in the 1980’s. Since then CSD has emerged as a highly flexible and cost-effective technique for the fabrication of a very wide variety of functional oxide thin films. Application areas include, for example, integrated dielectric capacitors, ferroelectric random access memories, pyroelectric infrared detectors, piezoelectric micro-electromechanical systems, antireflective coatings, optical filters, conducting-, transparent conducting-, and superconducting layers, luminescent coatings, gas sensors, thin film solid-oxide fuel cells, and photoelectrocatalytic solar cells. In the appendix detailed “cooking recipes” for selected material systems are offered.