



Foreword

Material Sciences

This thematic issue of *Comptes rendus Chimie* collects different articles devoted to Material Sciences. All articles show that Chemistry is to be considered as a key discipline towards new materials. Chemical processes may even be used to tailor specific properties of materials, the nano-dimension being one of the most popular scopes, as it has a big effect on the material behaviour and the physics. Very different aspects of the chemical approach to materials are illustrated in these articles. Inorganic networks including the elements silicon, boron, nitrogen and carbon with excellent high-temperature behaviour are described using a single-source precursor route (T. Jäschke and M. Jansen). The use of yttrium alkoxides as precursors to nanocrystalline powders of Y_2O_3 has been demonstrated: here the hydrolytic and hydrothermal conditions may be chosen in such a way that either amorphous or crystalline Y_2O_3 is obtained or even nanowires of yttrium hydroxide (L. Hubert-Pfalzgraf and S. Daniele). Intimate mixtures of organic polymers and oxides form hybrid materials and small angle X-ray scattering techniques may be used for their characterization (U. Schubert et al.). Another procedure toward amorphous SiBCO ceramics is the transformation of polymeric precursors to ceramics (R. Riedel et al.). The role of Chemical Solution Deposition (CSD)

techniques to electronic oxide films is discussed for the preparation of ultra-thin films of ferroelectrics, dielectrics, microstructures and epitaxial films (R. Waser et al.). As a detection method for new mixed oxide catalysts, a combinatorial approach is described in detail (J.W. Saalfrank and W.F. Maier). Also soft material (in the form of hyperbranched polymers) can be triggered by chemistry (C. Kim and H. Kim). Finally the arrangement of nano lead particles in inorganic channels by chemical infiltration methods is demonstrated (M. Veith et al.).

I would like to thank all authors for their contributions. This compilation covers different aspects of chemistry (the bottom-up approach, from molecules to solid state), physics (properties of materials), technology, new procedures, and basic research. I hope that it will contribute to promote further the developments of this interdisciplinary field.

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