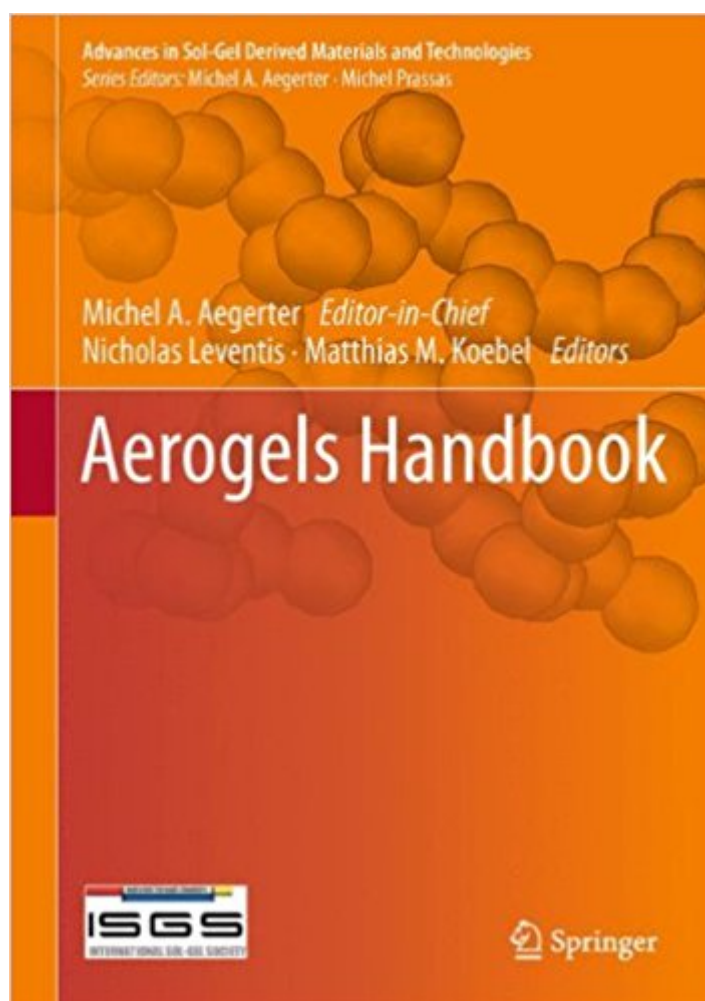




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Aerogels Handbook (Advances In Sol-Gel Derived Materials And Technologies)



Synopsis

Aerogels are the lightest solids known. Up to 1000 times lighter than glass and with a density as low as only four times that of air, they show very high thermal, electrical and acoustic insulation values and hold many entries in Guinness World Records. Originally based on silica, R&D efforts have extended this class of materials to non-silicate inorganic oxides, natural and synthetic organic polymers, carbon, metal and ceramic materials, etc. Composite systems involving polymer-crosslinked aerogels and interpenetrating hybrid networks have been developed and exhibit remarkable mechanical strength and flexibility. Even more exotic aerogels based on clays, chalcogenides, phosphides, quantum dots, and biopolymers such as chitosan are opening new applications for the construction, transportation, energy, defense and healthcare industries.

Applications in electronics, chemistry, mechanics, engineering, energy production and storage, sensors, medicine, nanotechnology, military and aerospace, oil and gas recovery, thermal insulation and household uses are being developed with an estimated annual market growth rate of around 70% until 2015. The Aerogels Handbook summarizes state-of-the-art developments and processing of inorganic, organic, and composite aerogels, including the most important methods of synthesis, characterization as well as their typical applications and their possible market impact. Readers will find an exhaustive overview of all aerogel materials known today, their fabrication, upscaling aspects, physical and chemical properties, and most recent advances towards applications and commercial products, some of which are commercially available today. Key Features:

- Edited and written by recognized worldwide leaders in the field
- Appeals to a broad audience of materials scientists, chemists, and engineers in academic research and industrial R&D
- Covers inorganic, organic, and composite aerogels
- Describes military, aerospace, building industry, household, environmental, energy, and biomedical applications among others

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Prof. Dr. Michel A. Aegerter graduated as Engineer and Physicist in 1962 at the Swiss Institute of

Technology- EPFL, Switzerland and received his Ph.D degree (Dr. $\tilde{f}$'s Sciences) in 1966 at the University of Neuch $\tilde{f}$ tel, Switzerland. After post-doctoral studies at the University of Utah, Salt Lake City, USA, he joined again the University of Neuch $\tilde{f}$ tel as assistant professor and then the University of Sao Paulo, Sao Carlos, Brazil as a full Professor till 1995 where he initiated research in the sol-gel field in 1984 with the collaboration of Prof. Dr. J. Zarzycki. In 1995 he accepted an invitation to be Director of the Department of Coating Technology at the Leibniz-Institute for New Materials gem. GmbH- INM in Saarbruecken, Germany, a position that he still hold. He is also Honorary Professor at the University of Saarland, Saarbruecken (Germany). He is the present Chairman of the Technical Committee TC-16 (Sol-Gel Glasses) of the International Commission on Glass (ICG), member of the American Ceramic Society, Material Research Society, SPIE, of several International Advisory Committees, of the Editorial Board of the International J. of Photochemistry, co-editor for Europe of the J. Sol-Gel Science and Technology, editorial Chairman of the International Conference on Coatings on Glass-ICCG as well as referee for several international scientific journals. His present fields of activity covers the research and industrial development of functional, conducting, photoelectrochemical and electrochromic coatings on glasses and plastics, the development of new sol-gel and nanocomposite coating technology. Prof. Dr. Aegerter is the author and co-author of more than 440 scientific publications, 8 patents and co-editor of 12 books.

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Another great Springer textbook. The colour photos are very clear, as are the various SEM, TEM etc images. No end of chapter questions/answers in this book, just references for the troves of information on all kinds of aerogels, associated manufacturing and testing equipment and

procedures, and plenty of chemistry. The many authors and the editorial team did a great job making this cutting edge technology very readable. No secrets here, this is a full disclosure effort to truly teach the reader, with thorough explanations including the hows and whys. I expect to learn from and enjoy this book for some time. For the curious, the thinkers and the contemplators, this text will definitely churn your mental gears, and so by doing, maybe even earn you back its cost!

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