# Index

"*This book provides fundamental underpinnings of a technique poised to make significant contributions to achieving the transition from laboratory-based nanotechnology to wide-ranging applications in commercial products, as well as emergent configurations and applications of the process, demonstrating the broad applicability of spark ablation for scientific, engineering, and manufacturing applications.*"

**Dr. Adam Boies**
Trinity College, University of Cambridge, UK

"*This book highlights the recent progress in design and spark-ablation-based manufacturing methods of nanoparticles, linking fundamental science to multiple applications from advanced materials to biomedicine. The approach is powerful and versatile and has promise of economic implementation in industry.*"

**Prof. Mihail C. Roco**
Key architect of the U.S. National Nanotechnology Initiative (2000–2020)

Spark ablation has been used worldwide for decades. However, in many fields, the special properties of nanoparticles, which come into play especially for sizes <20 nm, are just beginning to be exploited. The technique offers unprecedented flexibility regarding composition and size, and revolutions in the domains of catalysis and sensor technology, and more are to be expected. This book is the first review of spark ablation as a unique, scalable source of building blocks for nanotechnology and a powerful tool to promote this development. The introductory chapters give an overview of the technological fields that can exploit size effects, and explain the process of spark ablation in the gas phase, as well as principles of immobilizing particles to create novel products and materials. Fundamentals of the spark ablation process are then discussed, in addition to the characteristics of the particles formed. The rest of the book deals with a selection of application fields that profit from the spark ablation source from the perspective of research. With the authors' many years of experience in spark ablation and its applications, all the chapters complement one another and contain numerous cross-references in order to enable the reader to obtain a complete picture of the subject.

**Andreas Schmidt-Ott** obtained his PhD from the Faculty of Mathematics and Physics of ETH, Zurich, Switzerland, in 1979. He remained at ETH as a (senior) research fellow in the domains of solid-state physics and atmospheric physics until 1988. Subsequently, he joined the Faculty of Electrical Engineering at Duisburg University, Germany, as assistant professor and then became associate professor in the Mechanical Engineering Department of the same university, where he was deputy faculty chair from 1998 to 2001. He accepted a full professorship in nanoparticle technology at the Chemical Engineering Department of the Delft University of Technology, the Netherlands, where he has an emeritus status since 2018. Since 2016, he is also adjunct professor at the Cyprus Institute, Nicosia. Prof. Dr. Schmidt-Ott has served as secretary general of the German Aerosol Association and board member of the American Association for Aerosol Research. He is on the editorial boards of several journals and research associations and was an advisor to the Health Council of the Netherlands. In 2014, he cofounded the company VSPARTICLE (Delft, the Netherlands), which specializes in equipment for producing nanoparticles and nanoparticulate products as well as contract research in this domain, for which he is working as an advisor. His main area of expertise is nanoparticle and materials technology.

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