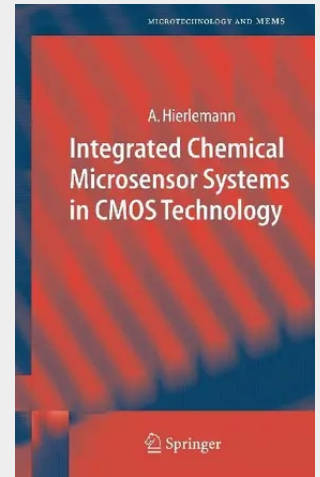


## Integrated Chemical Microsensor Systems in CMOS Technology

This book provides a comprehensive treatment of the very interdisciplinary field of CMOS technology-based chemical microsensor systems. It is, on the one hand, targeted at scientists and engineers interested in getting first sights in the field of chemical sensing since all necessary fundamental knowledge is included. On the other hand, it also addresses experts in the field since it provides detailed information on all important issues related to realizing chemical microsensors and, specifically, chemical microsensors in CMOS technology. A large number of sensor and integrated-sensor-system implementations illustrate the current state of the art and help to identify the possibilities for future developments. Since microsensors produce "microsignals", sensor miniaturization without sensor integration is in many cases prone to failure. This book will help to reveal the benefits of using integrated electronics and CMOS-technology for developing chemical microsensor systems and, in particular, the advantages that result from realizing monolithically integrated sensor systems comprising transducers and associated circuitry on a single chip. After a brief introduction, the fundamentals of chemical sensing are laid out, including a short excursion into the related thermodynamics and kinetics. Fabrication and processing steps that are commonly used in semiconductor industry are then abstracted. These more fundamental sections are followed by a short description of microfabrication techniques and the CMOS structures and materials. Thereafter, a comprehensive overview of semiconductor-based and CMOS-based transducer structures for chemical sensors is given.

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