

Chemical Mechanical Planarization of Microelectronic Materials

**Joseph M. Steigerwald
Shyam P. Murarka
Ronald J. Gutmann**

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Babu Suryadevara



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Chemical Mechanical Planarization of Microelectronic Materials Joseph M. Steigerwald, Ronald J. Gutmann, Shyam P. Murarka, 2004 Chemical Mechanical Planarization Of Microelectronic Materials J.M. Steigerwald, Chemical Mechanical Planarization of Microelectronic Materials Joseph M. Steigerwald, Shyam P. Murarka, Ronald J. Gutmann, 1997

The concluding chapter describes post CMP cleaning techniques and most chapters feature problem sets to assist readers in developing a more practical understanding of CMP The only comprehensive reference to one of the fastest growing integrated circuit manufacturing technologies Chemical Mechanical Planarization of Microelectronic Materials is an important resource for research scientists and engineers working in the microelectronics industry Chemical-Mechanical Planarization of Semiconductor Materials M.R. Oliver, 2013-03-14

Chemical Mechanical Planarization CMP has emerged in the last two decades and grown rapidly as a basic technology widely used in semiconductor device fabrication As a semiconductor processing step it was developed at IBM in the mid 1980s From this beginning the technology has been widely adopted throughout the semiconductor industry As basic CMP technology has been understood and accepted throughout the semiconductor industry its uses in different parts of the semiconductor process have multiplied This includes special steps for some special processing flows such as for DRAM technology In addition the availability of CMP technology has enabled the implementation of new technologies with the best example being copper interconnect technology Copper could not be practically implemented into semiconductor process flows until the advent of CMP Unfortunately the rapid acceptance and implementation of CMP technology in wafer fabrication has occurred without a corresponding rate of advance in the underlying science Progress is being made in understanding the underlying CMP mechanisms but in general it is slow and uneven The most noteworthy exception to this trend is the science of metal CMP reactions where the scientific understanding is actually driving much of the advance of the technology There has been no corresponding progress in other CMP areas however Microelectronic Applications of Chemical Mechanical Planarization Yuzhuo Li, 2007-10-19

An authoritative systematic and comprehensive description of current CMP technology Chemical Mechanical Planarization CMP provides the greatest degree of planarization of any known technique The current standard for integrated circuit IC planarization CMP is playing an increasingly important role in other related applications such as microelectromechanical systems MEMS and computer hard drive manufacturing This reference focuses on the chemical aspects of the technology and includes contributions from the foremost experts on specific applications After a detailed overview of the fundamentals and basic science of CMP Microelectronic Applications of Chemical Mechanical Planarization Provides in depth coverage of a wide range of state of the art technologies and applications Presents information on new designs capabilities and emerging technologies including topics like CMP with nanomaterials and 3D chips Discusses different types of CMP tools pads for IC CMP modeling and the applicability of tribometry to various aspects of CMP Covers nanotopography CMP performance

and defect profiles CMP waste treatment and the chemistry and colloidal properties of the slurries used in CMP Provides a perspective on the opportunities and challenges of the next fifteen years Complete with case studies this is a valuable hands on resource for professionals including process engineers equipment engineers formulation chemists IC manufacturers and others With systematic organization and questions at the end of each chapter to facilitate learning it is an ideal introduction to CMP and an excellent text for students in advanced graduate courses that cover CMP or related semiconductor manufacturing processes

Advances in Chemical Mechanical Planarization (CMP) Babu Suryadevara, 2021-09-10 *Advances in Chemical Mechanical Planarization* CMP Second Edition provides the latest information on a mainstream process that is critical for high volume high yield semiconductor manufacturing and even more so as device dimensions continue to shrink The second edition includes the recent advances of CMP and its emerging materials methods and applications including coverage of post CMP cleaning challenges and tribology of CMP This important book offers a systematic review of fundamentals and advances in the area Part one covers CMP of dielectric and metal films with chapters focusing on the use of current and emerging techniques and processes and on CMP of various materials including ultra low k materials and high mobility channel materials and ending with a chapter reviewing the environmental impacts of CMP processes New content addressed includes CMP challenges with tungsten cobalt and ruthenium as interconnect and barrier films consumables for ultralow topography and CMP for memory devices Part two addresses consumables and process control for improved CMP and includes chapters on CMP pads diamond disc pad conditioning the use of FTIR spectroscopy for characterization of surface processes and approaches for defection characterization mitigation and reduction *Advances in Chemical Mechanical Planarization* CMP Second Edition is an invaluable resource and key reference for materials scientists and engineers in academia and R D Reviews the most relevant techniques and processes for CMP of dielectric and metal films Includes chapters devoted to CMP for current and emerging materials Addresses consumables and process control for improved CMP including post CMP

Chemical Mechanical Planarization VI Sudipta Seal, 2003 **Chemical-Mechanical Planarization of Semiconductor Materials** M. R. Oliver, 2014-01-15 **Chemical Mechanical Polishing 10** G. Banerjee, 2009-05 The papers included in this issue of ECS Transactions were originally presented in the symposium Chemical Mechanical Polishing 10 held during the 215th meeting of The Electrochemical Society in San Francisco California from May 24 to 29 2009 **Processing and fabrication of advanced materials, XVII: Volume One**, 2009 Papers presented at the Seventeenth International Symposium on Processing and Fabrication of Advanced Material XVII held at New Delhi during 15 17 December 2008

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