Book Reviews: This section contains book reviews and comments about other recent products, e.g., software, websites, etc. Reviews are written on request of the editorial office. Suggestions about products to be reviewed are welcome. Publishers should send announcements or preferably products to the editorial office: *Plasma Processes and Polymers*, P.O. Box 101161, 69451 Weinheim, Germany. The editorial office decides which products are reviewed. Non-reviewed products are not returned.

H. Biederman

Plasma Polymer Films

Imperial College Press, London,
2004, hardcover, 386 pages
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Hynek Biederman of Charles University, Prague, has already written another book, entitled Plasma Polymerization Processes, with Y. Osada (Elsevier, Amsterdam 1992). In contrast to that monographic work, this book gathers the contributions of some of the world leaders in the plasma modification of polymers and covers a variety of complementary arguments. The readers of this volume will typically already have experience of plasma polymerisation for some applications and would like to have more information on state of the art methods and on future trends. Generally each chapter is a complete A to Z description of the arguments of the chapter title (with the exception of Chapter 8). The chapters usually gather together experiments, models, surfaces and plasma diagnostics and applications.

There is only one aspect of this mostly excellent book that I would wish to criticize lightly. A couple of important topics are either missing or not fully treated. An extended glossary of plasma and plasma polymerization terms with a dictionary of definitions is absent and a chapter devoted to reactor design and to transfer from lab- to large-scale systems would also be a useful addition.

In Chapter 1, Introduction, Biederman aims to fill in the gaps in knowledge of an accidental reader with an introduction to the field. The chapter gathers together the first concepts and definitions of plasma deposition, models of polymerization, etc. This chapter is very useful for beginners, who are taken by the hand and led through the various applications of plasma polymerization, i.e. the chapters of the book.

Chapter 2, Plasma Deposition of Fluoropolymer Films in Different Glow Discharge, is a monograph by Pietro Favia (Bari, Italy) containing a complete description of Teflon-like polymers. It extensively deals with monomers, active species, kinetics, models, processes of deposition, in situ diagnostics and process control. It also covers the updated issue of superhydrophobic coatings produced by plasma modulation and micro- and nano-structuring of fluoropolymers.

Chapter 3, Deposition of Silicon Containing Films and FT-IR Diagnostics, is a full and updated description by Yvan Segui and Patrice Rainaud (Toulouse, France) on processes for silica and silicone-like coatings, one of the most appealing and successful issues. In this work, the authors also sweep through monomers, precursors, plasma generation, reactors and in situ gas phase diagnostics (optical emission, mass spectrometry and infrared absorption spectrometry are dealt with in detail). There is also a chapter devoted to open questions on polymer precursors and growth mechanisms.

Chapter 4, Corpuscular Diagnostics of Plasma Polymerization Processes, by Michael Zeuner (Chemnitz, Germany) is an extensive description of the plasma generation of particles and of their fluxes to substrates. The author looks into the issue of the interactions of particles with surfaces from all points of view, including generation, potentials inside the discharge, collection and energy selection. The effects of the particles impinging onto the surfaces are examined along with the different instruments and detectors for neutrals and ions. The cases of silanes, siloxanes, freons and hydrocarbons are examined as well as the sputtering of PTFE. Both RF and MW systems are analysed.

Chapter 5, Electrical and Optical Properties of Plasma Properties, Jacek Tyczkowski (Lodz, Poland) is an extensive and detailed description of the electrical and optical properties of various plasma polymers (both organic and inorganic), grouped as amorphous semiconductors and amorphous insulators. Models of electrical transport and conductivity are discussed and some practical applications, such as amorphous superlattice structures and FET, are also examined.

Chapter 6, Pulsed Plasma Polymerization, is a broad and updated description of polymers produced by plasma modulation written by Richard B. Timmons and Andrew J. Griggs (Arlington, Texas, USA). The authors discuss the different features of modulated and CW discharges and show how modulation can control polymer composition, structure and properties. A short review of applications based on surface tailoring with modulated discharges concludes this chapter.

Chapter 7, Stability of Plasma Polymers and Plasma Coatings, by Andreas Holländer and Jörg Thome (Potsdam, Germany) has a strong practical relevance in that it shifts the attention of the

reader onto the performance of plasma modified and plasma produced polymers with time. The classes of polymers examined are broad, including fluoropolymers, silicone-like polymers, hydrocarbons and aromatic polymers. The chemical and photochemical mechanisms of oxidation and their influence on short term and long term stability are discussed with a critical eye.

Chapter 8, Application of Atmospheric Pressure Discharge for Plasma Polymer Processes, is a (too) short chapter by Masuhiro Kogoma (Tokyo, Japan) devoted to the application of Atmospheric Pressure Glow Discharges (APGD) for the deposition of fluorocarbon- and hydrocarbon-based polymers and silicone-like polymers. Some attention is given to diagnostics of the discharges, but, in contrast to the other chapters in the book, it makes reference exclusively to the previous work of the author.

With Chapter 9, Hard Plasma Polymers, Composites and Plasma Polymer Films Prepared by RF Sputtering of Conventional Polymers, Hynek Biederman, Pavel Kudrna and Danka Slavinská (Prague, Czech Republic) make a comprehensive review of metal-containing polymer films produced by different combinations of plasma/sputtering/evaporation techniques. Also, hard films are examined in this chapter. Optical, electrical and mechanical properties, as well as the structure and morphology of the films, are discussed, always in great detail. The sputtering of Teflon targets is also included.

Chapter 10, Biomedical Applications of Plasma-deposited Thin Films, by Kathryn J. Kitching, Vicki Pan and Buddy D. Ratner (Seattle, Washington, USA) is a complete review entirely devoted to applications in the field of bio-medicine. This is a useful tool for biologists, medical doctors, bio-industrialists, plasma chemists and physicists who would like to gain an insight into the perspectives of plasma products for biomedical applications. Issues such as tissue culture, controlled release, blood-contacting devices and contact lenses are examined with an expert and application-aimed eye.

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