Part VII
Electrochemical Processes and Tools

Part VII is about electrochemical processing tools for ULSI interconnect technology development. Chapter 26 provides the introductory remarks and a brief discussion of the impact of Electrochemical Processing Tools in the semiconductor industry particularly in dual Damascene plating for copper chip metallization. New challenges in further miniaturization of interconnects provide ample opportunities for the development of novel electrochemical processes and tools and to make significant contribution toward continuation of Moore's Law. The following chapters of this part on Processes and Tools cover in detail some of the topics mentioned in this introductory note. Semiconductor equipment industry experts have been invited to write on these topics. In Chapters 27, 28 and 29 Tom Ritzdorf and his team from Semitool provide a detailed description of advanced electrodeposition processes and tools for copper interconnects technology and control of electrodeposition processes; electroless deposition processes for copper, nickel and gold, and tools; and equipments for monitoring and control of bath components, respectively. In Chapter 30 Bill Lee and Igor Ivanov of Blue29 describe the evolving electroless Co and CoW capping technology. This chapter includes Co alloy capping applications, film properties and requirements, process sequence and integration, and deposition chemistry for Co alloy capping along with the Co alloy capping system. Finally, in Chapter 31 Bulent Basol of ASMNutool describes advanced planarization techniques including electrochemical polishing methods, novel electropolishing approaches, electrochemical mechanical deposition, and electro chemical mechanical planarization.