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Nota di contenuto	Porous Silicon in Practice: Preparation, Characterization and Applications; Contents; Preface; 1: Fundamentals of Porous Silicon Preparation; 1.1 Introduction; 1.2 Chemical Reactions Governing the Dissolution of Silicon; 1.2.1 Silicon Oxides and Their Dissolution in HF; 1.2.2 Silicon Oxides and Their Dissolution in Basic Media; 1.2.3 Silicon Hydrides; 1.3 Experimental Set-up and Terminology for Electrochemical Etching of Porous Silicon; 1.3.1 Two-Electrode Cell; 1.3.2 Three-Electrode Cell; 1.4 Electrochemical Reactions in the Silicon System 1.4.1 Four-Electron Electrochemical Oxidation of Silicon1.4.2 Two-Electron Electrochemical Oxidation of Silicon; 1.4.3 Electropolishing; 1.5 Density, Porosity, and Pore Size Definitions; 1.6 Mechanisms of Electrochemical Dissolution and Pore Formation; 1.6.1 Chemical Factors Controlling the Electrochemical Etch; 1.6.2 Crystal Face Selectivity; 1.6.3 Physical Factors Controlling the Electrochemical Etch; 1.7 Resume of the Properties of Crystalline Silicon; 1.7.1 Orientation; 1.7.2 Band

Structure; 1.7.3 Electrons and Holes; 1.7.4 Photoexcitation of Semiconductors; 1.7.5 Dopants
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1.8.4.2 Making an Ohmic Contact by Mechanical AbrasionReferences; 2: Preparation of Micro-, Meso-, and Macro-Porous Silicon Layers; 2.1 Etch Cell: Materials and Construction; 2.2 Power Supply; 2.3 Other Supplies; 2.4 Safety Precautions and Handling of Waste; 2.5 Preparing HF Electrolyte Solutions; 2.6 Cleaning Wafers Prior to Etching; 2.6.1 No Precleaning; 2.6.2 Ultrasonic Cleaning; 2.6.3 RCA Cleaning; 2.6.4 Removal of a Sacrificial Porous Layer with Strong Base; 2.7 Preparation of Microporous Silicon from a p-Type Wafer; 2.8 Preparation of Mesoporous Silicon from a p++-Type Wafer
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3.2 Pore Modulation in the z-Direction: Double Layer

Sommario/riassunto

By means of electrochemical treatment, crystalline silicon can be permeated with tiny, nanostructured pores that entirely change the characteristics and properties of the material. One prominent example of this can be seen in the interaction of porous silicon with living cells, which can be totally unwilling to settle on smooth silicon surfaces but readily adhere to porous silicon, giving rise to great hopes for suchfuture applications as programmable drug delivery or advanced, braincontrolled prosthetics. Porous silicon research is active in the fieldsof sensors, tissue engineering