

1. Record Nr.	UNINA9910828834303321
Titolo	Chromium : environmental, medical, and materials studies // editor, Margaret P. Salden
Pubbl/distr/stampa	New York, : Nova Science Publishers, c2011
ISBN	1-61209-048-6
Edizione	[1st ed.]
Descrizione fisica	1 online resource (400 p.)
Collana	Chemical engineering methods and technology
Altri autori (Persone)	SaldenMargaret P
Disciplina	620.1/8934
Soggetti	Chromium Chromium compounds
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intro -- CHROMIUM: ENVIRONMENTAL, MEDICAL AND MATERIALS STUDIES -- CHROMIUM: ENVIRONMENTAL, MEDICAL AND MATERIALS STUDIES -- CONTENTS -- PREFACE -- Chapter 1 TREATMENT OF CHROMIUM CONTAMINATION IN THE ENVIRONMENT -- 1. INTRODUCTION -- 2. CHROMIUM IS IMPORTANT -- 2.1. Physical and Chemical Properties of Chromium -- 2.2. Chromium Use -- 2.3. Chromium Regulations in Wastewater -- 3. TREATMENT TECHNOLOGIES FOR CHROMIUM REMOVAL -- 3.1. Precipitation -- 3.2. Ion Exchange -- 3.3. Reverse Osmosis -- 3.4. Adsorption Method -- Physisorption -- Chemisorption -- 4. CR(VI) ADSORPTION FROM WASTEWATER BY COIR PITH -- 4.1. Coir Pith -- 4.2. Adsorption Isotherm for Cr(VI) Adsorption by Coir Pith -- 4.2.1. Langmuir isotherm -- 4.2.2. Freundlich isotherm -- 4.3. Mechanism of Chromium Adsorption by Coir Pith -- 4.3.1. X-ray absorption spectroscopy (XAS) -- 4.3.2. FTIR Spectroscopy -- 4.3.3. Electron spin resonance (ESR) -- 4.4.4. Desorption -- 5. INCREASING CR(VI) ADSORPTION BY COIR PITH GRAFTED WITH CHEMICAL REAGENTS -- 6. APPLICATION OF COLUMN STUDY FOR CHROMIUM REMOVAL FROM INDUSTRIAL WASTEWATER -- 6.1. Effect of Flow Rate on the Breakthrough Curves -- 6.2. Bed Depth Service time (BDST) Model -- 6.3. Application of the Thomas Model -- 6.4. Desorption and Column Regeneration -- 7. CONCLUSIONS -- REFERENCES -- Chapter 2 CHROMIUM TOXICITY: FREE RADICAL ASPECTS -- ABSTRACT -- INTRODUCTION -- 1. CHROMIUM AS A CHEMICAL ELEMENT AND ITS

ENVIRONMENTAL SOURCES -- 1.1. Chromium Characteristics -- 1.2. Natural Sources of Chromium -- 1.3. Anthropogenic Sources of Chromium -- 2. CHROMIUM ABSORPTION AND RELEASE BY LIVING ORGANISMS -- 3. CHROMIUM-INDUCED GENERATION OF REACTIVE OXYGEN SPECIES -- 3.1. Free Radicals, Reactive Oxygen Species and Oxidative Stress -- 3.2. Involvement of Chromium in Production of Reactive Oxygen Species.

4. CHROMIUM-MEDIATED ROS-INDUCED MODIFICATION OF CELLULAR MACROMOLECULES -- 4.1. Damage to Proteins -- 4.2. Damage to Lipids -- 4.3. DNA Breakage -- 5. TOXICITY OF CHROMIUM -- 5.1. Mutagenicity -- 5.2. Cytotoxicity -- 5.3. Immunotoxicity -- 6. BIOLOGICAL REDUCTION OF CHROMIUM -- 6.1. Enzymatic Reduction of Chromium -- 6.2. Reduction of Chromium by Low Molecular Mass Compounds: Glutathione and Ascorbate -- 7. MOLECULAR MECHANISMS OF CHROMIUM-INDUCED UPREGULATION OF ANTIOXIDANTS -- 7.1. Stabilization of HIF-1 -- 7.2. Activation of P53 Nuclear Factor -- 7.3. Activation of Nrf2/Keap1 System --

CONCLUSIONS AND PERSPECTIVES -- REFERENCES -- Chapter 3 CHROMIUM IN MEMS TECHNOLOGY -- ABSTRACT -- INTRODUCTION -- WHAT IS MEMS TECHNOLOGY -- RELEVANT PROPERTIES OF CHROMIUM FOR MEMS TECHNOLOGY -- Mechanical and Physical Properties -- Chemical Properties -- Thin Film Deposition Techniques -- Sputtering -- Evaporation -- Electroplating -- Wet Chemical Etching of Chromium -- Dry Etching of Chromium -- Chromium in Lithographic Masks -- Hard Masks -- Adhesion Layers -- Chromium Alloys -- Thin Films Resistors -- Other Applications -- REFERENCES -- Chapter 4 THE CELLULAR RESPONSE TO CHROMIUM (VI) - INDUCED DNA DAMAGE -- ABSTRACT -- I. CHROMIUM EXPOSURE -- II. TYPES OF CHROMIUM-INDUCED DNA DAMAGE -- III. REPAIR OF CHROMIUM-INDUCED DNA DAMAGE -- Nucleotide Excision Repair -- Base Excision Repair -- Repair of Double-Strand Breaks and Replication-Associated Damage -- Mismatch Repair -- Checkpoint Control through DNA Damage Signaling -- IV. THE ROLE OF THE DNA DAMAGE RESPONSE IN CR(VI)-ASSOCIATED CARCINOGENESIS -- V. UNANSWERED QUESTIONS AND CHALLENGES FOR FUTURE RESEARCH -- REFERENCES -- Chapter 5 CHROMIUM PICOLINATE INDUCES DNA DAMAGE, SENESCENCE AND CELL DEATH IN NORMAL COLONIC FIBROBLASTS -- ABSTRACT -- 1. INTRODUCTION -- 2. MATERIALS AND METHODS -- Cell Line. Treatments -- Chemiluminescent Quantitation of DNA Synthesis -- Cell Cycle Analysis -- Measurement of Oxidative Stress -- Measurement of DNA Damage - Comet Assay -- ERK, P38 and JNK Activities -- Immunoblotting -- Epigenetic Assay -- Cellular Senescence Assay -- Cell Death Analysis -- Criteria for Determination of Type of Cell Death -- Statistics -- 3. RESULTS -- DNA Synthesis and Cell Cycle -- DNA Damage and Oxidative Stress -- EPIGENETIC CHANGES -- MAPK Activities -- Cellular Senescence and Cell Death -- Effects of Pharmacological Inhibitors on Senescence, -- Apoptosis and Autophagy -- 4. DISCUSSION -- 5. CONCLUSION -- ACKNOWLEDGMENT -- REFERENCES -- Chapter 6 CHROMIUM COMPLEXES BASED CATALYSTS: THE ROLE OF THE LIGAND NATURE IN THE POLYMERIZATION OF CONJUGATED DIOLIFINS AND CYCLOOLEFINS -- ABSTRACT -- 1. INTRODUCTION -- 2. POLYMERIZATION OF 1,3-DIENES -- 2.1. Polydienes: Structures and Polymerization Mechanism -- 2.2. Ziegler-Natta Chromium Catalysts -- 2.3. Synthesis and Characterization of Diphosphine Chromium Complexes -- 2.4. Diphosphine Chromium Complexes Based Catalysts -- 2.5. Polymerization of Substituted Butadienes -- 2.6. Mechanistic Considerations -- 2.7. Butadiene-Isoprene Copolymerization -- 3. POLYMERIZATION OF NORBORNENE --

3.1. Polynorbornenes: Modes of Polymerization and Structures -- 3.2. Polymerization of Norbornene with Chromium Catalysts -- 4. CONCLUSION -- REFERENCES -- Chapter 7 HETEROGENEOUS CATALYSTS BASED ON CHROMIUM SITES: SYNTHESIS, CHARACTERIZATION AND APPLICATIONS -- ABSTRACT -- 1. INTRODUCTION -- 2. CHROMIUM CATALYSTS FOR ETHYLENE POLYMERIZATION -- 2.1. Chromium Catalysts Supported on Amorphous Materials -- Effect of Hydroxyl Population -- Effect of Support Chemical Composition -- Effect of Support Porosity -- 2.2. Chromium Catalysts Supported on Mesoporous Materials. 3. CHROMIUM CATALYSTS FOR OXIDATION REACTIONS -- 3.1. Heterogeneous Chromium Catalysts for Cyclohexane Oxidation -- 3.2. Heterogeneous Chromium Catalysts for the Oxidation of Other Organic Compounds -- 4. CHROMIUM CATALYSTS FOR DEHYDROGENATION REACTIONS -- 5. FINAL REMARKS -- REFERENCES -- Chapter 8 MACROPOROUS AND NON-POROUS AMINO-FUNCTIONALIZED GLYCIDYL METHACRYLATE BASED COPOLYMERS FOR HEXAVALENT CHROMIUM ADSORPTION -- ABSTRACT -- 1. INTRODUCTION -- 2. EXPERIMENTAL -- 2.1. Materials -- 2.2. Analysis and Spectroscopy -- 2.3. Preparation of PGME -- 2.4. Functionalization of PGME with Diethylene Triamine -- 2.5. Chromium Adsorption Batch Experiments -- 3. RESULTS AND DISCUSSION -- 3.1. Synthetic Aspects -- 3.2. Chromium(VI) Adsorption on Amino-Functionalized PGME -- 3.3. Kinetic Models -- CONCLUSION -- ACKNOWLEDGMENTS -- REFERENCES -- Chapter 9 TREATMENT OF CHROMIUM POLLUTED WATER THROUGH BIOSORPTION - AN ENVIRONMENT FRIENDLY APPROACH -- ABSTRACT -- INTRODUCTION -- HEAVY METAL POLLUTION -- CHROMIUM -- COMMON METAL REMOVAL TECHNIQUES -- BIOSORPTION - A SIMPLE, ECONOMICAL AND ECO-FRIENDLY APPROACH -- REFERENCES -- Chapter 10 RECYCLING OF LEATHER WASTE CONTAINING CHROMIUM - A REVIEW -- ABSTRACT -- 1. INTRODUCTION -- 2. COLLAGEN STRUCTURE AND CHROMIUM TANNING -- 3. DIRECT APPLICATIONS OF CHROMIUM TANNED LEATHER WASTE -- 3.1. Direct Use in Tanning Process -- 3.2. Use as Adsorption and Adsorbent Material -- 3.3. Addition to Clays for Bricks and Tiles Manufacture -- 4. COMPOSITES INCORPORATING CHROMIUM-TANNED LEATHER WASTE FIBERS -- 5. CHROMIUM-CONTAINING WASTE HYDROLYSIS AND RESULTING PRODUCTS USE -- 5.1. Oxidative Decoloring -- 5.2. Acid Hydrolysis -- 5.3. Alkaline Hydrolysis -- 5.4. Enzymatic Hydrolysis -- 5.5. Gelable Fraction and Hydrolysates Reuse in Leather Industry -- Condensates of Collagen By-Products with Formaldehyde and Glutaraldehyde. Modification of Collagen By-Products with Microbial Transglutaminase, Casein and Whey -- Chemical Modification of Collagen by-Products with Acrylic Acid and Related Polymers -- Miscellaneous Modifications and Mixtures -- 5.6. Gelable Fraction and Hydrolysates Use in Other Industrial Processes -- Gelatin By-Products Applications -- Collagen Hydrolysates Application in Agriculture and Animal Feed Supplement -- Use in Rubber, Surfactants, Glues and Adhesives -- Use in Biodegradable Plastics, Fibers and Biotechnological Applications -- Building Industry -- Biomethanization -- 5.7. Alkaline and Alkaline Enzymatic Hydrolysis Chromium Cake/Sludge Reuse -- 6. ENERGY RECOVERY -- 7. CONCLUSIONS -- REFERENCES -- Chapter 11 COMPUTER SIMULATION OF CrO_2 SURFACE -- Abstract -- 1. Introduction -- 2. A Simple Transferable Interatomic Potential Model for Binary Oxides -- 2.1. Interaction Potential -- 2.2. Fitting Methodology -- 2.3. Simplification of the Interaction Potential -- 2.4.

Transferability of the Model to MgO and CaO -- 3. Computer Modelling of -
Cr₂O₃ and -Fe₂O₃ with a Modified Matsui Potential -- 3.1.
Potential and Fitting Procedure -- 3.2. Computer Modelling of -Cr₂O₃ and
-Fe₂O₃ -- 4. Calculation of Native Defect Energies in -Al₂O₃, -Cr₂O₃ and -
Fe₂O₃ using a Modified Matsui Potential -- 4.1.
Potential Parameters and Mott-Littleton Theory -- 4.2.
Calculation of native defect energies -- 4.2.1. Convergence test -- 4.2.2.
Defect energies -- 5. Molecular Dynamics Simulation of the (0001) -
Al₂O₃ and -Cr₂O₃ Surfaces -- 5.1. Molecular Dynamics Simulation Details
-- 5.2. Thermal Expansion Coefficients -- 5.3. Surface Relaxation -- 5.4.
Surface Dynamics -- 6. Structure and Surface Energy of Low-
index Surfaces of Stoichiometric -Al₂O₃ and -Cr₂O₃ -- 6.1. Hartree-
Fock Simulation Details -- 6.2. Surface Relaxation -- 6.3. Surface Energy
-- 7. Structure and Electronic Properties Calculation of Ultrathin -
Al₂O₃ films on (0001) -Cr₂O₃ Templates.
7.1. Hartree-Fock Simulation Details for Single Cell Calculations.
