

1. Record Nr.	UNINA9910822158903321
Titolo	Plasma chemistry and catalysis in gases and liquids // edited by Vasile I. Parvulescu, Monica Magureanu, and Petr Lukes
Pubbl/distr/stampa	Weinheim, : Wiley-VCH Verlag GmbH & Co. KGaA, c2012
ISBN	9786613656209 9783527649549 3527649549 9781280679278 1280679271 9783527649525 3527649522 9783527649556 3527649557
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (421 p.)
Altri autori (Persone)	ParvulescuV. I (Vasile I.) MagureanuMonica LukesPetr
Disciplina	541.0424
Soggetti	Plasma chemistry Catalysis Gases Liquids
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	Plasma Chemistry and Catalysis in Gases and Liquids; Contents; Preface; List of Contributors; 1 An Introduction to Nonequilibrium Plasmas at Atmospheric Pressure; 1.1 Introduction; 1.1.1 Nonthermal Plasmas and Electron Energy Distributions; 1.1.2 Barrier and Corona Streamer Discharges - Discharges at Atmospheric Pressure; 1.1.3 Other Nonthermal Discharge Types; 1.1.3.1 Transition to Sparks, Arcs, or Leaders; 1.1.4 Microscopic Discharge Mechanisms; 1.1.4.1 Bulk Ionization Mechanisms; 1.1.4.2 Surface Ionization Mechanisms; 1.1.5 Chemical Activity; 1.1.6 Diagnostics; 1.2 Coronas and Streamers

1.2.1 Occurrence and Applications 1.2.2 Main Properties of Streamers; 1.2.3 Streamer Initiation or Homogeneous Breakdown; 1.2.4 Streamer Propagation; 1.2.4.1 Electron Sources for Positive Streamers; 1.2.5 Initiation Cloud, Primary, Secondary, and Late Streamers; 1.2.6 Streamer Branching and Interaction; 1.3 Glow Discharges at Higher Pressures; 1.3.1 Introduction; 1.3.2 Properties; 1.3.3 Studies; 1.3.4 Instabilities; 1.4 Dielectric Barrier and Surface Discharges; 1.4.1 Basic Geometries; 1.4.2 Main Properties; 1.4.3 Surface Discharges and Packed Beds; 1.4.4 Applications of Barrier Discharges 1.5 Gliding Arcs 1.6 Concluding Remarks; References; 2 Catalysts Used in Plasma-Assisted Catalytic Processes: Preparation, Activation, and Regeneration; 2.1 Introduction; 2.2 Specific Features Generated by Plasma-Assisted Catalytic Applications; 2.3 Chemical Composition and Texture; 2.4 Methodologies Used for the Preparation of Catalysts for Plasma-Assisted Catalytic Reactions; 2.4.1 Oxides and Oxide Supports; 2.4.1.1 Al<sub>2</sub>O<sub>3</sub>; 2.4.1.2 SiO<sub>2</sub>; 2.4.1.3 TiO<sub>2</sub>; 2.4.1.4 ZrO<sub>2</sub>; 2.4.2 Zeolites; 2.4.2.1 Metal-Containing Molecular Sieves; 2.4.3 Active Oxides; 2.4.4 Mixed Oxides; 2.4.4.1 Intimate Mixed Oxides 2.4.4.2 Perovskites 2.4.5 Supported Oxides; 2.4.5.1 Metal Oxides on Metal Foams and Metal Textiles; 2.4.6 Metal Catalysts; 2.4.6.1 Embedded Nanoparticles; 2.4.6.2 Catalysts Prepared via Electroplating; 2.4.6.3 Catalysts Prepared via Chemical Vapor Infiltration; 2.4.6.4 Metal Wires; 2.4.6.5 Supported Metals; 2.4.6.6 Supported Noble Metals; 2.5 Catalysts Forming; 2.5.1 Tableting; 2.5.2 Spherulizing; 2.5.3 Pelletization; 2.5.4 Extrusion; 2.5.5 Foams; 2.5.6 Metal Textile Catalysts; 2.6 Regeneration of the Catalysts Used in Plasma Assisted Reactions; 2.7 Plasma Produced Catalysts and Supports 2.7.1 Sputtering 2.8 Conclusions; References; 3 NO<sub>x</sub> Abatement by Plasma Catalysis; 3.1 Introduction; 3.1.1 Why Nonthermal Plasma-Assisted Catalytic NO<sub>x</sub> Remediation?; 3.2 General deNO<sub>x</sub> Model over Supported Metal Cations and Role of NTP Reactor: "Plasma-Assisted Catalytic deNO<sub>x</sub> Reaction"; 3.3 About the Nonthermal Plasma for NO<sub>x</sub> Remediation; 3.3.1 The Nanosecond Pulsed DBD Reactor Coupled with a Catalytic deNO<sub>x</sub> Reactor: a Laboratory Scale Device Easily Scaled Up at Pilot Level; 3.3.2 Nonthermal Plasma Chemistry and Kinetics; 3.3.3 Plasma Energy Deposition and Energy Cost 3.4 Special Application of NTP to Catalytic Oxidation of Methane on Alumina-Supported Noble Metal Catalysts

## Sommario/riassunto

Filling the gap for a book that not only covers gases but also plasma methods in liquids, this is all set to become the standard reference on the topic. It considers the central aspects in plasma chemistry and plasma catalysis by focusing on the green and environmental applications, while also taking into account their practical and economic viability. With the topics addressed by an international group of major experts, this is a must-have for researchers, PhD students and postdocs specializing in the field.