

1. Record Nr.	UNINA9910784527703321
Autore	Glassman Irvin
Titolo	Combustion [[electronic resource] /] / Irvin Glassman
Pubbl/distr/stampa	San Diego, Calif., : Academic Press, c1996
ISBN	1-281-31144-8 9786611311445 0-08-052941-0
Edizione	[3rd ed.]
Descrizione fisica	1 online resource (651 p.)
Disciplina	541.3/61
Soggetti	Combustion Thermochemistry
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 indexes.
Nota di contenuto	Front Cover; Combustion; Copyright Page; Contents; Preface; Acknowledgments; Chapter 1. Chemical Thermodynamics and Flame Temperatures; A. Introduction; B. Heats of Reaction and Formation; C. Free Energy and the Equilibrium Constants; D. Flame Temperature Calculations; Problems; References; Chapter 2. Chemical Kinetics; A. Introduction; B. Rates of Reactions and Their Temperature Dependence; C. Simultaneous Interdependent Reactions; D. Chain Reactions; E. Pseudo-First-Order Reactions and the "Fall-Off" Range; F. The Partial Equilibrium Assumption; G. Pressure Effect in Fractional Conversion ProblemsReferences; Chapter 3. Explosive and General Oxidative Characteristics of Fuels; A. Introduction; B. Chain Branching Reactions and Criteria for Explosion; C. Explosion Limits and Oxidation Characteristics of Hydrogen; D. Explosion Limits and Oxidation Characteristics of Carbon Monoxide; E. Explosion Limits and Oxidation Characteristics of Hydrocarbons; F. The Oxidation of Aldehydes; G. The Oxidation of Methane; H. The Oxidation of Higher-Order Hydrocarbons; Problems; References; Chapter 4. Flame Phenomena in Premixed Combustible Gases; A. Introduction; B. Laminar Flame Structure C. The Laminar Flame SpeedD. Stability Limits of Laminar Flames; E. Turbulent Reacting Flows and Turbulent Flames; F. Stirred Reactor

Theory; G. Flame Stabilization in High-Velocity Streams; Problems; References; Chapter 5. Detonation; A. Introduction; B. Detonation Phenomena; C. Hugoniot Relations and the Hydrodynamic Theory of Detonations; D. Comparison of Detonation Velocity Calculations with Experimental Results; E. The ZND Structure of Detonation Waves; F. The Structure of the Cellular Detonation Front and Other Detonation Phenomena Parameters; G. Detonations in Nongaseous Media ProblemsReferences; Chapter 6. Diffusion Flames; A. Introduction; B. Gaseous Fuel Jets; C. Burning of Condensed Phases; D. Burning of Droplet Clouds; E. Burning in Convective Atmospheres; Problems; References; Chapter 7. Ignition; A. Concepts; B. Chain Spontaneous Ignition; C. Thermal Spontaneous Ignition; D. Forced Ignition; Problems; References; Chapter 8. Environmental Combustion Considerations; A. Introduction; B. The Nature of Photochemical Smog; C. Formation and Reduction of Nitrogen Oxides; D. SO_x Emissions; E. Particulate Formation; F. Stratospheric Ozone; Problems; References Chapter 9. Combustion of Nonvolatile FuelsA. Carbon Char, Soot, and Metal Combustion; B. Metal Combustion Thermodynamics; C. Diffusional Kinetics; D. Diffusion-Controlled Burning Rate; E. The Burning of Porous Chars; F. The Burning Rate of Ash-Forming Coal; Problems; References; Appendixes; A. Thermochemical Data and Conversion Factors; B. Specific Reaction Rate Constants; C. Bond Dissociation Energies of Hydrocarbons; D. Laminar Flame Speeds; E. Flammability Limits in Air; F. Spontaneous Ignition Temperature Data; G. Minimum Spark Ignition Energies and Quenching Distances H. Programs for Combustion Kinetics

Sommario/riassunto

This Third Edition of Glassman's classic text clearly defines the role of chemistry, physics, and fluid mechanics as applied to the complex topic of combustion. Glassman's insightful introductory text emphasizes underlying physical and chemical principles, and encompasses engine technology, fire safety, materials synthesis, detonation phenomena, hydrocarbon fuel oxidation mechanisms, and environmental considerations. Combustion has been rewritten to integrate the text, figures, and appendixes, detailing available combustion codes, making it not only an excellent introductory text but al
