

1. Record Nr.	UNINA9910806910403321
Autore	Glassman Irvin
Titolo	Combustion // Irvin Glassman, Richard A. Yetter, Nick G. Glumac
Pubbl/distr/stampa	Waltham, Massachusetts : , : Academic Press, , 2015 ©2015
ISBN	0-12-411555-1
Edizione	[Fifth edition.]
Descrizione fisica	1 online resource (775 p.)
Disciplina	541/.361
Soggetti	Combustion
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 at the end of each chapters and index.
Nota di contenuto	Front Cover; Combustion; Copyright; Dedication; Dedication; Contents; Preface; Chapter 1 - Chemical thermodynamics and flame temperatures; 1.1 INTRODUCTION; 1.2 HEATS OF REACTION AND FORMATION; 1.3 FREE ENERGY AND THE EQUILIBRIUM CONSTANTS; 1.4 FLAME TEMPERATURE CALCULATIONS; 1.5 SUB AND SUPERSONIC COMBUSTION THERMODYNAMICS; PROBLEMS; REFERENCES; Chapter 2 - Chemical kinetics; 2.1 INTRODUCTION; 2.2 RATES OF REACTIONS AND THEIR TEMPERATURE DEPENDENCE; 2.3 SIMULTANEOUS INTERDEPENDENT REACTIONS; 2.4 CHAIN REACTIONS; 2.5 PSEUDO-FIRST-ORDER REACTIONS AND THE "FALLOFF" RANGE 2.6 THE PARTIAL EQUILIBRIUM ASSUMPTION 2.7 PRESSURE EFFECT IN FRACTIONAL CONVERSION; 2.8 CHEMICAL KINETICS OF LARGE REACTION MECHANISMS; PROBLEMS; REFERENCES; Chapter 3 - Explosive and general oxidative characteristics of fuels; 3.1 INTRODUCTION; 3.2 CHAIN BRANCHING REACTIONS AND CRITERIA FOR EXPLOSION; 3.3 EXPLOSION LIMITS AND OXIDATION CHARACTERISTICS OF HYDROGEN; 3.4 EXPLOSION LIMITS AND OXIDATION CHARACTERISTICS OF CARBON MONOXIDE; 3.5 EXPLOSION LIMITS AND OXIDATION CHARACTERISTICS OF HYDROCARBONS; 3.6 THE OXIDATION OF ALDEHYDES; 3.7 THE OXIDATION OF METHANE 3.8 THE OXIDATION OF HIGHER-ORDER HYDROCARBONS PROBLEMS; REFERENCES; Chapter 4 - Flame phenomena in premixed combustible gases; 4.1 INTRODUCTION; 4.2 LAMINAR FLAME STRUCTURE; 4.3

LAMINAR FLAME SPEED; 4.4 STABILITY LIMITS OF LAMINAR FLAMES; 4.5 FLAME PROPAGATION THROUGH STRATIFIED COMBUSTIBLE MIXTURES; 4.6 TURBULENT REACTING FLOWS AND TURBULENT FLAMES; 4.7 STIRRED REACTOR THEORY; 4.8 FLAME STABILIZATION IN HIGH-VELOCITY STREAMS; 4.9 COMBUSTION IN SMALL VOLUMES; PROBLEMS; REFERENCES; Chapter 5 - Detonation; 5.1 INTRODUCTION; 5.2 DETONATION PHENOMENA
5.3 HUGONIOT RELATIONS AND THE HYDRODYNAMIC THEORY OF DETONATIONS
5.4 COMPARISON OF DETONATION VELOCITY CALCULATIONS WITH EXPERIMENTAL RESULTS; 5.5 THE ZND STRUCTURE OF DETONATION WAVES; 5.6 THE STRUCTURE OF THE CELLULAR DETONATION FRONT AND OTHER DETONATION PHENOMENA PARAMETERS; 5.7 DETONATIONS IN NONGASEOUS MEDIA; PROBLEMS; REFERENCES; Chapter 6 - Diffusion flames; 6.1 INTRODUCTION; 6.2 GASEOUS FUEL JETS; 6.3 BURNING OF CONDENSED PHASES; 6.4 BURNING OF DROPLET CLOUDS; 6.5 BURNING IN CONVECTIVE ATMOSPHERES; PROBLEMS; REFERENCES; Chapter 7 - Ignition; 7.1 CONCEPTS
7.2 CHAIN SPONTANEOUS IGNITION
7.3 THERMAL SPONTANEOUS IGNITION; 7.4 FORCED IGNITION; 7.5 OTHER IGNITION CONCEPTS; PROBLEMS; REFERENCES; Chapter 8 - Environmental combustion considerations; 8.1 INTRODUCTION; 8.2 THE NATURE OF PHOTOCHEMICAL SMOG; 8.3 FORMATION AND REDUCTION OF NITROGEN OXIDES; 8.4 SOX EMISSIONS; 8.5 PARTICULATE FORMATION; 8.6 STRATOSPHERIC OZONE; PROBLEMS; REFERENCES; Chapter 9 - Combustion of nonvolatile fuels; 9.1 CARBON CHAR, SOOT, AND METAL COMBUSTION; 9.2 METAL COMBUSTION THERMODYNAMICS; 9.3 DIFFUSIONAL KINETICS; 9.4 DIFFUSION-CONTROLLED BURNING RATE
9.5 PRACTICAL CARBONACEOUS FUELS (C. R. SHADDIX)

Sommario/riassunto

Throughout its previous four editions, Combustion has made a very complex subject both enjoyable and understandable to its student readers and a pleasure for instructors to teach. With its clearly articulated physical and chemical processes of flame combustion and smooth, logical transitions to engineering applications, this new edition continues that tradition. Greatly expanded end-of-chapter problem sets and new areas of combustion engineering applications make it even easier for students to grasp the significance of combustion to a wide range of engineering practice, from transportation to
