

1. Record Nr.	UNINA9910410001903321
Autore	Date Anil Waman
Titolo	Analytic Combustion : With Thermodynamics, Chemical Kinetics and Mass Transfer // by Anil Waman Date
Pubbl/distr/stampa	Singapore : , : Springer Singapore : , : Imprint : Springer, , 2020
ISBN	981-15-1853-X
Edizione	[2nd ed. 2020.]
Descrizione fisica	1 online resource (XXI, 405 p. 92 illus., 4 illus. in color.)
Disciplina	541.361015118
Soggetti	Thermodynamics Heat engineering Heat transfer Mass transfer Physical chemistry Fluid mechanics Chemical engineering Engineering Thermodynamics, Heat and Mass Transfer Physical Chemistry Engineering Fluid Dynamics Industrial Chemistry/Chemical Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- Thermodynamics of a Pure Substance -- Thermodynamics of Gaseous Mixtures -- Chemical Equilibrium -- Chemical Kinetics -- Derivation of Transport Equations -- Thermochemical Reactors -- Premixed Flames -- Diffusion Flames -- Combustion of Particles and Droplets -- Combustion Applications -- APPENDIX-A Thermochemistry Data -- APPENDIX-B Curve-Fit Coefficients for h_c , T_{ad} , K_p , c_p , h and s -- APPENDIX-C Properties of Fuels -- APPENDIX-D Thermophysical and Transport -- APPENDIX-E Atmospheric Data -- APPENDIX-F Binary Diffusion Coefficients -- Bibliography -- Index.
Sommario/riassunto	This book is intended to serve as a textbook for advanced undergraduate and graduate students as well as professionals engaged

in application of thermo-fluid science to the study of combustion. The relevant thermo-chemistry and thermo-physical data required for this study are provided in the 6 appendices along with appropriate curve-fit coefficients. To facilitate gradual learning, two chapters are devoted to thermodynamics of pure and gaseous mixture substances, followed by one chapter each on chemical equilibrium and chemical kinetics. This material when coupled with a dedicated chapter on understanding of equations governing transport of momentum, heat and mass in the presence of chemical reactions provides adequate grounding to undertake analysis of practical combustion equipment, of premixed and diffusion flames as well as of solid particle and liquid droplet combustion. The learnings from the aforementioned chapters are taken to a uniquely strong chapter on application case studies, some of which have special relevance for developing countries.
