



Experimental Combustion: An Introduction

By D. P. Mishra

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Fulfilling the need for a classical approach, **Experimental Combustion: An Introduction** begins with an overview of the key aspects of combustion?including chemical kinetics, premixed flame, diffusion flame, and liquid droplet combustion?followed by a discussion of the general elements of measurement systems and data acquisition and analysis. In addition to these aspects, thermal flow measurements, gas composition measurements, and optical combustion diagnostics are covered extensively.

Building upon this foundation in the fundamentals, the text addresses measurements, instruments, analyses, and diagnostics specific to combustion experiments, as well as:

- Describes the construction, working principles, application areas, and limitations of the necessary instruments for combustion systems
- Familiarizes the reader with the procedure for uncertainty analysis in combustion experiments
- Discusses advanced optical techniques, namely particle image velocimetry (PIV), laser Doppler anemometry (LDA), and planar laser-induced fluorescence (PLIF) methods

From stoichiometry to smoke meters and statistical analysis, **Experimental Combustion: An Introduction** provides a solid understanding of the underlying concepts and measurement tools required for the execution and interpretation of practical combustion experiments.

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Editorial Review

Review

"... other books available in this area do not cover the detailed topics covered here. Energy and combustion is a hot issue. It is expected to be even hotter with more demand in this area as we search for cleaner methods of energy conversion from chemical to thermal energy."

?Ashwani K. Gupta, Department of Mechanical Engineering, University of Maryland, College Park, USA

"Providing a collection of measurement techniques that are generally never combined into one book makes this book unusual and valuable for anyone wanting to learn about various methods that could be used to characterize flame combustion or other gaseous combustion events."

?IEEE Electrical Insulation, November/December 2016

About the Author

Dr. D. P. Mishra is a professor in the Department of Aerospace Engineering at the Indian Institute of Technology (IIT) Kanpur, where he has been instrumental in establishing a combustion laboratory. His areas of research include combustion, computational fluid dynamics, and atomization. He is also an assistant editor for the *International Journal of Hydrogen Energy*, Elsevier, USA, and serves as an editorial board member for several other international journals. He has been the recipient of several awards, including the Young Scientist Award, INSA-JSPS Fellowship, Sir Rajendranath Mookerjee Memorial Award, and Samanta Chadrachar Award. Dr. Mishra has six Indian patents and more than 178 research papers published in referred journals and conference proceedings. He has authored two textbooks titled *Fundamentals of Combustion*, published by Prentice Hall of India, and *Engineering Thermodynamics*, published by Cengage India Pvt. Ltd., New Delhi.

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