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Chemistry of Pyrotechnics Basic Principles and Theory

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The Creation of Chemistry - The Fundamental Laws: Crash Course Chemistry #3*Chemistry and Mechanics in Fireworks The Science of Fireworks - with Chris Bishop* ~~Basics of Pyrotechnics: Reactants, Products, and Energy~~ *NEC Article 500, Hazardous (Classiified) Locations The Science of Pyrotechnic Effects – with Matthew Tosh* It's Rocket Science! with Professor Chris Bishop ~~Fireworks Basics : MAKING FIREWORKS STARS~~ Intro to Chemistry, Basic Concepts - Periodic Table, Elements, Metric System \u0026 Unit Conversion Dr Andrew Szydlo: A Brief History of Boom! ~~How do Fireworks Work? Fireworks Made Easy: A Chemist Shows The Inner Workings of Pyrotechnics~~ **An Explosive Passion for Teaching Chemistry | Andrew Szydlo | TEDxManchester** ~~A New Phase for Structural Biology – with Carol Robinson~~ ~~Howard \u0026 Sons Pyrotechnics Documentary~~ Chemistry Of Pyrotechnics Basic Principles
Designed as a bridge to allow a smooth and confident transition for personnel coming from a chemistry background into the practical world of explosives, Chemistry of Pyrotechnics: Basic Principles and Theory, Second Edition emphasizes basic chemical principles alongside practical, hands-on knowledge in the preparation of energetic mixtures. It examines the interactions between and adaptations of pyrotechnics to changing technology in areas such as obscuration science and low-signature flame ...

Chemistry of Pyrotechnics: Basic Principles and Theory ...
A perennial bestseller, Chemistry of Pyrotechnics and Explosives: Basic Principles and Theory, is simply the most definitive reference in this field. Author J.A. Conkling first covers the requisite background in chemistry, thermodynamics, and light emission, introduces oxidizing agents, fuels, binders, and retardants, then explores virtually every aspect of formulating pyrotechnics.

Chemistry of Pyrotechnics: Basic Principles and Theory ...
Chemistry of Pyrotechnics: Basic Principles and Theory, Second Edition eBook: Mocella, Chris, Conkling, John A.: Amazon.co.uk: Kindle Store

Chemistry of Pyrotechnics: Basic Principles and Theory ...
The updated third edition discusses chemical and pyrotechnic principles, components of high-energy materials, elements of ignition, propagation, and sensitivity. It offers heat compositions, including ignition mixes, delays, thermites, and propellants and investigates the production of smoke and sound as well as light and color.

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Chemistry of Pyrotechnics: Basic Principles and Theory ...
Promoting the growth and expansion of pyrotechnics as a science, Chemistry of Pyrotechnics: Basic Principles and Theory, Second Edition provides practitioners with the ability to apply chemical principles and logic to energetic materials and thereby make the field as productive, useful, and safe as possible.

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Chemistry of Pyrotechnics: Basic Principles and Theory, 2nd edition, by John A.Conkling and Christopher J.Mocella. CRC Press: Boca Raton, FL, 2011. 245 pp. ISBN: 978-1574447408 (hardcover). $94.95. Cited By

Review of Chemistry of Pyrotechnics: Basic Principles and ...
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Chemistry of Pyrotechnics and Explosives: Basic Principles ...
The Chemistry of Pyrotechnics Basic Course is a 4-day course designed to provide students with a firm understanding of the basic principles of pyrotechnics, propellants and explosives. These principles are presented from a chemistry perspective and will be understood by both students with a small amount of chemistry background and those more deeply involved with energetic chemistry.

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This book provides chemists with technical insight on pyrotechnics and explosives. It emphasizes basic chemical principles and practical, hands-on knowledge in the preparation of energetic materials. It examines the interactions between and adaptations of pyrotechnics to changing technology in areas such as obscuration science and low-signature flame emission. The updated third edition discusses chemical and pyrotechnic principles, components of high-energy materials, elements of ignition, propagation, and sensitivity. It offers heat compositions, including ignition mixes, delays, thermites, and propellants and investigates the production of smoke and sound as well as light and color.

A perennial bestseller, Chemistry of Pyrotechnics and Explosives: Basic Principles and Theory, is simply the most definitive reference in this field. Author J.A. Conkling first covers the requisite background in chemistry, thermodynamics, and light emission, introduces oxidizing agents, fuels, binders, and retardants, then explores virtually every aspect of formulating pyrotechnics. Topics include the requirements for and preparation of high-energy mixtures, ignition and propagation, heat and delay compositions, and color and light production, including sparks, flitter, and glitter. The journal Pyrotechnica said this book "...belongs on every pyrotechnist's bookshelf."

Primarily driven by advancing technology and concerns for safety, advancement in the world of pyrotechnics and high-energy materials has exploded in the past 25 years. The promulgation of new government regulations places new and more stringent restrictions on the materials that may be used in energetic mixtures. These regulations now mandate numerous training programs, and initiate other actions, such as OSHA's Process Safety Management standard, intended to eliminate accidents and incidents. Unfortunately, the US lacks an organized, broad-range academic program to cover the science and use of energetic materials and educate the next generation of pyrotechnicians. Designed as a bridge to allow a smooth and confident transition for personnel coming from a chemistry background into the practical world of explosives, Chemistry of Pyrotechnics: Basic Principles and Theory, Second Edition emphasizes basic chemical principles alongside practical, hands-on knowledge in the preparation of energetic mixtures. It examines the interactions between and adaptations of pyrotechnics to changing technology in areas such as obscuration science and low-signature flame emission. Much more than a simple how-to guide, the book discusses chemical and pyrotechnic principles, components of high-energy mixtures, and elements of ignition, propagation, and sensitivity. It offers heat compositions, including ignition mixes, delays, thermites, and propellants and investigates the production of smoke and sound as well as light and color. Promoting the growth and expansion of pyrotechnics as a science, Chemistry of Pyrotechnics: Basic Principles and Theory, Second Edition provides practitioners with the ability to apply chemical principles and logic to energetic materials and thereby make the field as productive, useful, and safe as possible.

For centuries fireworks have been a source of delight and amazement in cultures around the world. But what produces their dazzling array of effects? This book takes you behind the scenes to explore the chemistry and physics behind the art of pyrotechnics. Topics covered include history and characteristics of gunpowder; principles behind each of the most popular firework types: rockets, shells, fountains, sparklers, bangers, roman candles and wheels; special effects, including sound effects, coloured smokes and electrical firing; firework safety for private use and displays; and firework legislation. The Chemistry of Fireworks is aimed at students with A level qualifications or equivalent. The style is concise and easy to understand, and the theory of fireworks is discussed in terms of well-known scientific concepts wherever possible. It will also be a useful source of reference for anyone studying pyrotechnics as applied to fireworks. Review Extracts "a worthwhile addition to the pyrotechnist's library" Fireworks "a useful source of information which makes absorbing reading."" Angewandte Chemie, International Edition.

"Revised and expanded to reflect new developments in the field, this book outlines the basic principles required to understand the chemical processes of explosives. The Chemistry of Explosives provides an overview of the history of explosives, taking the reader to future developments. The text on the classification of explosive materials contains much data on the physical parameters of primary and secondary explosives. The explosive processes of deflagration and detonation, including the theory of 'hotspots' for the detonation process, are introduced and many examples are provided in the detailed description on the thermochemistry of explosives. New material includes coverage of the latest explosive compositions, such as high temperature explosives, nitrocubanes, energetic polymers, plasticizers and insensitive munitions (IM). This concise, readable book is ideal for 'A' level students and new graduates with no previous knowledge of explosive materials. With detailed information on a vast range of explosives in tabular form and an extensive bibliography, this book will also be useful to anyone needing succinct information on the subject."

Authored by an insider with over 40 years of high energy materials (HEMs) experience in academia, industry and defense organizations, this handbook and ready reference covers all important HEMs from the 1950s to the present with their respective properties and intended purposes. Written at an attainable level for professionals, engineers and technicians alike, the book provides a comprehensive view of the current status and suggests further directions for research and development. An introductory chapter on the chemical and thermodynamic basics allows the reader to become acquainted with the fundamental features of explosives, before moving on to the important safety aspects in processing, handling, transportation and storage of high energy materials. With its collation of results and formulation strategies hitherto scattered in the literature, this should be on the shelf of every HEM researcher and developer.

This text is written at an introductory to intermediate level. As such it is intended for readers with limited prior knowledge of chemistry or limited knowledge regarding specific areas of applied pyrotechnics. One goal of this text was to provide an extensive list of references, thus directing readers to sources of additional information. With a total of approximately 400 references that goal has been met; however, for the most part, citations to material that is readily found in numerous reference texts have not been included. Only when the information is attributable to a limited number of authors are specific references generally cited.The chapters are a collection of 19 papers written by 12 authors, covering most of the important ar-eas of pyrotechnic chemistry. While this format causes the text to be written in styles that differ somewhat from chapter to chapter, it also provides an opportunity to have each of the chapters written by persons with expertise and current knowledge in each of the various subject areas. (Brief bio-graphical information about the authors is included at the end of the preface.) Also, having each sub-ject written as a stand alone chapter, means that a reader wishing information on a specific subject will generally not have to refer to other chapters for the background and ancillary information needed to fully comprehend the subject.Almost all of the chapters have been published previously; however, they were originally written with the intention of being chapters in this text and have been updated since their original publication. The authors of each chapter are identified at the start of each chapter, and the citation for where the material was originally published appears at the end of each chapter. Because most of the chapters have been published previously, and to simplify the task publishing this compilation, in most cases the authors were individually responsible for editing their chapters.

This third edition of the classic on the thermochemical aspects of the combustion of propellants and explosives is completely revised and updated and now includes a section on green propellants and offers an up-to-date view of the thermochemical aspects of combustion and corresponding applications. Clearly structured, the first half of the book presents an introduction to pyrodynamics, describing fundamental aspects of the combustion of energetic materials, while the second part highlights applications of energetic materials, such as propellants, explosives and pyrolants, with a focus on the phenomena occurring in rocket motors. Finally, an appendix gives a brief overview of the fundamentals of aerodynamics and heat transfer, which is a prerequisite for the study of pyrodynamics. A detailed reference for readers interested in rocketry or explosives technology.

Thermites, which are generally considered to be reactive mixtures of powdered metals and metal oxides, are an important subset of energetic materials. The underlying thermodynamic properties of a given mixture dictate whether it may undergo a self-sustaining reaction, liberating heat in the process. Thermodynamic information in the existing scientific literature regarding thermitic combinations is scattered and incomplete. Currently, a comprehensive overview of this nature would be of great use to those working in the areas of pyrotechnics, pyrometallurgy, high-temperature chemistry, and materials science. Thermitic Thermodynamics solves this problem by describing the results of calculations on over 800 combinations of metal, metalloid, and metal oxide reactants. Other features include: A first-of-its-kind adiabatic survey of binary thermitic reactions Provides an overview of key trends in exothermic metal-metal oxide reactivity Describes the role of non-oxide product formation in thermitic systems Explains how to interpret the results of thermochemical calculations effectively An invaluable resource, this book provides an accessible introduction for students and is also an enduring guide for professionals.

Written by an engineer for engineers, this book is both training manual and on-going reference, bringing together all the different facets of the complex processes that must be in place to minimize the risk to people, plant and the environment from fires, explosions, vapour releases and oil spills. Fully compliant with international regulatory requirements, relatively compact but comprehensive in its coverage, engineers, safety professionals and concerned company management will buy this book to capitalize on the author's life-long expertise. This is the only book focusing specifically on oil and gas and related chemical facilities. This new edition includes updates on management practices, lessons learned from recent incidents, and new material on chemical processes, hazards and risk reviews (e.g. CHAZOP). Latest technology on fireproofing, fire and gas detection systems and applications is also covered. An introductory chapter on the philosophy of protection principles along with fundamental background material on the properties of the chemicals concerned and their behaviours under industrial conditions, combined with a detailed section on modern risk analysis techniques makes this book essential reading for students and professionals following Industrial Safety, Chemical Process Safety and Fire Protection Engineering courses. A practical, results-oriented manual for practicing engineers, bringing protection principles and chemistry together with modern risk analysis techniques Specific focus on oil and gas and related chemical facilities, making it comprehensive and compact Includes the latest best practice guidance, as well as lessons learned from recent incidents