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twenty years ago author kurt stern produced four monographs for the national bureau of standards on the high temperature properties of inorganic salts containing oxyanions although relied upon by scientists and engineers around the world these monographs have now become increasingly difficult to access and increasingly outdated high temperature properties and thermal decomposition of inorganic salts with oxyanions unifies expands upon and brings up to date those standard setting documents it offers both qualitative and quantitative information on the behavior and properties of approximately 300 compounds complete with thermodynamic tables of decomposition equilibria and information regarding decomposition kinetics for each class of compounds an existence chart in the form of a periodic table tells you at a glance which compounds are known to exist those whose existence is uncertain and those about which nothing is known supplementary tables give information about phase transitions and densities in both solid and liquid phases within this single volume the author provides a comprehensive critical review of the high temperature properties of all the major classes of inorganic salts with oxyanions if you work with materials or processes that involve salts at elevated temperatures you now have an authoritative resource that obviates the need to perform extensive literature searches data evaluations and thermodynamic calculations and saves you time this book covers the results of investigations into the mechanisms and kinetics of thermal decompositions of solid and liquid substances on the basis of thermochemical analyses the main features of these reactions are explained and many problems and unusual phenomena which have accumulated in this field are interpreted new methods of measurement and calculation have been developed which permit the precision and accuracy of determination of kinetic parameters to be increased substantially the principal objective of this book is to stimulate interest in research that will extend available theory towards a greater understanding of the steps involved in solid state decompositions and the properties of solids that control reactivities much of the activity in this field has been directed towards increasing the range of reactants for which decomposition kinetic data is available rather than extending insights into the fundamental chemistry of the reactions being studied the first part of the book chapters 1-6 is concerned with theoretical aspects of the subject the second part chapters 7-17 surveys groups of reactions classified by similarities of chemical composition the final chapter 18 reviews the subject by unifying features identified as significant and proposes possible directions for future progress studies of thermal reactions of ionic compounds have contributed considerably to the theory of solid state chemistry furthermore many of these rate processes have substantial technological importance for example in the manufacture of cement the exploitation of ores and in the stability testing of drugs explosives and oxidizing agents despite the prolonged and continuing research effort concerned with these reactions there is no recent overall review this book is intended to contribute towards correcting this omission the essential unity of the subject is recognized by the systematic treatment of reactions carefully selected to be instructive and representative of the subject as a whole the authors have contributed more than 200 original research articles to the literature many during their 25 years of collaboration features of this book gives a comprehensive in depth survey of a rarely reviewed subject reviews methods used in studies of thermal decompositions of solids discusses patterns of subject development perceived from an extensive literature survey this book is expected to be of greatest value and interest to scientists concerned with the chemical properties and reactions of solids including chemists physicists pharmacists material scientists

crystallographers metallurgists and others this wide coverage of the literature dealing with thermal reactions of solids will be of value to both academic and industrial researchers by reviewing the current status of the theory of the subject it could also provide a useful starting point for the exploitation of crystalline materials in practical and industrial applications the contents will also be relevant to a wide variety of researchers including for example those concerned with the stabilities of polymers and composite materials the processing of minerals the shelf lives of pharmaceuticals etc this unique book investigates the synthesis kinetics and thermal decomposition properties and processing of energy producing materials used in propellants explosives pyrotechnic and gas generating compositions thermal decomposition and combustion of explosives and propellants provides several mechanisms and stages for the thermal deco in some new technological processes the heating and resulting transformation of substances takes place in fractions of a second such processes include high frequency heating of materials plasma processing of materials laser technology etc traditional methods and standard equipment used in thermal analysis are for slow heating rates of the sample viz at about 2 20 k min therefore rapid chemical reactions with a characteristic time of about one second may escape the attention of the researcher the purpose of this book is to explain problems regarding the micro and macrokinetics of the thermolysis of substances and complex materials subjected to intensive heating it is possible to carry out experiments at heating rates of more than 10 4 k s with the new special quick response pulse heaters described during such experiments several hitherto unknown rapid reactions and thermolysis processes of an explosive nature have been established these reactions take place in a few seconds to a hundredth of a second the book gives physical and mathematical models of thermolysis for all these processes it will be of interest to scientists dealing with thermodynamics and rate processes polymer materials composite materials chemical kinetics and transfer processes thermal degradation of polymeric materials second edition offers a wealth of information for polymer researchers and processors who require a thorough understanding of the implications of thermal degradation on materials and product performance sections cover thermal degradation mechanisms and kinetics as well as various techniques such as thermogravimetry in combination with mass spectroscopy and infrared spectrometry to investigate thermal decomposition routes other chapters focus on polymers and copolymers including polyolefins styrene polymers polyvinyl chloride polyamides polyurethanes polyesters polyacrylates natural polymers inorganic polymers high temperature resistant and conducting polymers blends organic inorganic hybrid materials nanocomposites and biocomposites finally other key considerations such as recycling of polymers by thermal degradation thermal degradation during processing and modelling are discussed in detail explains mechanisms of polymer degradation making it possible to understand and predict material behavior at elevated temperatures offers systematic coverage of each polymer group that is supported by data detailed explanations and critical analysis investigates thermal decomposition routes in new materials such as organic inorganic hybrid materials and polymer nanocomposites the reactions involving aromatic hydrocarbons play a crucial role in the combustion chemistry for the formation and growth of polyaromatic hydrocarbons pahs in this work the thermal decomposition of the single ring aromatics benzene phenyl and ortho benzyne have been investigated behind reflected shock waves by using a sensitive detection technique atomic resonance absorption spectroscopy aras the unimolecular decomposition of ortho benzyne was investigated behind reflected shock waves by taking 1 2 diiodobenzene as the thermal source the initial concentration of ortho benzyne was determined in situ with i aras simultaneously the progress of reaction was monitored by measuring the produced h atoms with h aras by reproducing the experimental h atom concentration time profiles a two channel decomposition model of ortho benzyne was developed by investigating the thermal decomposition of phenyl and benzene a complete detailed chemical reaction model was elaborated which is able to

capture the measured hydrogen atom concentration profiles over the whole investigated parameter range thus the present work may contribute to a better understanding and describing of high temperature combustion of aromatics which are considered as major soot precursors excerpt from the thermal decomposition of oil shales dissertation submitted in partial fulfillment of the requirements for the degree of doctor of philosophy in the faculty of pure science columbia university inspissated petroleum little is known as to the origin or nature of kerogen or other organic material in the shale that all of the organic or carbonaceous matter does not produce oil is known 7 e h cunningham craig attributes the origin of kerogen to inspissated or dried up petroleum he concludes that the oil shale stratum is a former oil bearing formation which under the action of heat has evaporated and dried up leaving petroleum residues which have become insoluble by polymerization 4 other authorities are not inclined to accept this theory as they see no substantial evidence of petroleum having passed through the formation about the publisher forgotten books publishes hundreds of thousands of rare and classic books find more at forgottenbooks.com this book is a reproduction of an important historical work forgotten books uses state of the art technology to digitally reconstruct the work preserving the original format whilst repairing imperfections present in the aged copy in rare cases an imperfection in the original such as a blemish or missing page may be replicated in our edition we do however repair the vast majority of imperfections successfully any imperfections that remain are intentionally left to preserve the state of such historical works this work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it this work was reproduced from the original artifact and remains as true to the original work as possible therefore you will see the original copyright references library stamps as most of these works have been housed in our most important libraries around the world and other notations in the work this work is in the public domain in the united states of america and possibly other nations within the united states you may freely copy and distribute this work as no entity individual or corporate has a copyright on the body of the work as a reproduction of a historical artifact this work may contain missing or blurred pages poor pictures errant marks etc scholars believe and we concur that this work is important enough to be preserved reproduced and made generally available to the public we appreciate your support of the preservation process and thank you for being an important part of keeping this knowledge alive and relevant this work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it this work was reproduced from the original artifact and remains as true to the original work as possible therefore you will see the original copyright references library stamps as most of these works have been housed in our most important libraries around the world and other notations in the work this work is in the public domain in the united states of america and possibly other nations within the united states you may freely copy and distribute this work as no entity individual or corporate has a copyright on the body of the work as a reproduction of a historical artifact this work may contain missing or blurred pages poor pictures errant marks etc scholars believe and we concur that this work is important enough to be preserved reproduced and made generally available to the public we appreciate your support of the preservation process and thank you for being an important part of keeping this knowledge alive and relevant this unique book investigates the synthesis kinetics and thermal decomposition properties and processing of energy producing materials used in propellants explosives pyrotechnic and gas generating compositions thermal decomposition and combustion of explosives and propellants provides several mechanisms and stages for the thermal decomposition and combustion reactions of most flammable compounds and their mixtures such as aliphatic and aromatic nitrocompounds nitramines nitroesters organic azides furazanes tetrazols difluoroamines polynitrous heterocycles and onium salts the authors examine the classic problem of the dependence of explosive activity on

molecular structure using applications to predict the stability compatibility and the stabilization of explosives and propellant components they also offer experimental results examining factors such as subsurface decomposition evaporation and dispersion of materials which can be used to control combustion of condensed systems providing several approaches to stability safety and controlled combustion of flammable substances thermal decomposition and combustion of explosives and propellants is a multi dimensional resource for graduate students researchers and professionals interested in chemical kinetics the combustion and synthesis of high energy materials criminal forensics and the field of explosives powders and solid rocket propellants this work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it this work was reproduced from the original artifact and remains as true to the original work as possible therefore you will see the original copyright references library stamps as most of these works have been housed in our most important libraries around the world and other notations in the work this work is in the public domain in the united states of america and possibly other nations within the united states you may freely copy and distribute this work as no entity individual or corporate has a copyright on the body of the work as a reproduction of a historical artifact this work may contain missing or blurred pages poor pictures errant marks etc scholars believe and we concur that this work is important enough to be preserved reproduced and made generally available to the public we appreciate your support of the preservation process and thank you for being an important part of keeping this knowledge alive and relevant

High Temperature Properties and Thermal Decomposition of Inorganic Salts with Oxyanions 2000-09-21 twenty years ago author kurt stern produced four monographs for the national bureau of standards on the high temperature properties of inorganic salts containing oxyanions although relied upon by scientists and engineers around the world these monographs have now become increasingly difficult to access and increasingly outdated high temperature properties and thermal decomposition of inorganic salts with oxyanions unifies expands upon and brings up to date those standard setting documents it offers both qualitative and quantitative information on the behavior and properties of approximately 300 compounds complete with thermodynamic tables of decomposition equilibria and information regarding decomposition kinetics for each class of compounds an existence chart in the form of a periodic table tells you at a glance which compounds are known to exist those whose existence is uncertain and those about which nothing is known supplementary tables give information about phase transitions and densities in both solid and liquid phases within this single volume the author provides a comprehensive critical review of the high temperature properties of all the major classes of inorganic salts with oxyanions if you work with materials or processes that involve salts at elevated temperatures you now have an authoritative resource that obviates the need to perform extensive literature searches data evaluations and thermodynamic calculations and saves you time

Thermal Decomposition of Solids and Melts 2007-08-24 this book covers the results of investigations into the mechanisms and kinetics of thermal decompositions of solid and liquid substances on the basis of thermochemical analyses the main features of these reactions are explained and many problems and unusual phenomena which have accumulated in this field are interpreted new methods of ta measurement and calculation have been developed which permit the precision and accuracy of determination of kinetic parameters to be increased substantially

Thermal Decomposition of Ionic Solids 1999-02-25 the principal objective of this book is to stimulate interest in research that will extend available theory towards a greater understanding of the steps involved in solid state decompositions and the properties of solids that control reactivities much of the activity in this field has been directed towards increasing the range of reactants for which decomposition kinetic data is available rather than extending insights into the fundamental chemistry of the reactions being studied the first part of the book chapters 1 6 is concerned with theoretical aspects of the subject the second part chapters 7 17 surveys groups of reactions classified by similarities of chemical composition the final chapter 18 reviews the subject by unifying features identified as significant and proposes possible directions for future progress studies of thermal reactions of ionic compounds have contributed considerably to the theory of solid state chemistry furthermore many of these rate processes have substantial technological importance for example in the manufacture of cement the exploitation of ores and in the stability testing of drugs explosives and oxidizing agents despite the prolonged and continuing research effort concerned with these reactions there is no recent overall review this book is intended to contribute towards correcting this omission the essential unity of the subject is recognized by the systematic treatment of reactions carefully selected to be instructive and representative of the subject as a whole the authors have contributed more than 200 original research articles to the literature many during their 25 years of collaboration features of this book gives a comprehensive in depth survey of a rarely reviewed subject reviews methods used in studies of thermal decompositions of solids discusses patterns of subject development perceived from an extensive literature survey this book is expected to be of greatest value and interest to scientists concerned with the chemical properties and reactions of solids including chemists physicists pharmacists material scientists crystallographers metallurgists and others this wide coverage of the literature

dealing with thermal reactions of solids will be of value to both academic and industrial researchers by reviewing the current status of the theory of the subject it could also provide a useful starting point for the exploitation of crystalline materials in practical and industrial applications the contents will also be relevant to a wide variety of researchers including for example those concerned with the stabilities of polymers and composite materials the processing of minerals the shelf lives of pharmaceuticals etc

Thermal Decomposition and Combustion of Explosives and Propellants 2003-01-30 this unique book investigates the synthesis kinetics and thermal decomposition properties and processing of energy producing materials used in propellants explosives pyrotechnic and gas generating compositions thermal decomposition and combustion of explosives and propellants provides several mechanisms and stages for the thermal deco

Thermal Decomposition of Pyruvic Acid and Its Esters Leading to CO₂ 1956 in some new technological processes the heating and resulting transformation of substances takes place in fractions of a second such processes include high frequency heating of materials plasma processing of materials laser technology etc traditional methods and standard equipment used in thermal analysis are for slow heating rates of the sample viz at about 2 20 k min therefore rapid chemical reactions with a characteristic time of about one second may escape the attention of the researcher the purpose of this book is to explain problems regarding the micro and macrokinetics of the thermolysis of substances and complex materials subjected to intensive heating it is possible to carry out experiments at heating rates of more than 10 4 k s with the new special quick response pulse heaters described during such experiments several hitherto unknown rapid reactions and thermolysis processes of an explosive nature have been established these reactions take place in a few seconds to a hundredth of a second the book gives physical and mathematical models of thermolysis for all these processes it will be of interest to scientists dealing with thermodynamics and rate processes polymer materials composite materials chemical kinetics and transfer processes

Kinetics of Thermal Decomposition of Copper (II) Sulfate and Copper (II) Oxysulfate 1972 thermal degradation of polymeric materials second edition offers a wealth of information for polymer researchers and processors who require a thorough understanding of the implications of thermal degradation on materials and product performance sections cover thermal degradation mechanisms and kinetics as well as various techniques such as thermogravimetry in combination with mass spectroscopy and infrared spectrometry to investigate thermal decomposition routes other chapters focus on polymers and copolymers including polyolefins styrene polymers polyvinyl chloride polyamides polyurethanes polyesters polyacrylates natural polymers inorganic polymers high temperature resistant and conducting polymers blends organic inorganic hybrid materials nanocomposites and biocomposites finally other key considerations such as recycling of polymers by thermal degradation thermal degradation during processing and modelling are discussed in detail explains mechanisms of polymer degradation making it possible to understand and predict material behavior at elevated temperatures offers systematic coverage of each polymer group that is supported by data detailed explanations and critical analysis investigates thermal decomposition routes in new materials such as organic inorganic hybrid materials and polymer nanocomposites

The Thermal Decomposition of Esters, Polyesters and Related Substances 1960 the reactions involving aromatic hydrocarbons play a crucial role in the combustion chemistry for the formation and growth of polyaromatic hydrocarbons pahs in this work the thermal decomposition of the single ring aromatics benzene phenyl and ortho benzyne have been investigated behind reflected shock waves by using a sensitive detection technique atomic resonance absorption

spectroscopy as the unimolecular decomposition of ortho benzyne was investigated behind reflected shock waves by taking 1,2-didehydrobenzene as the thermal source the initial concentration of ortho benzyne was determined in situ with it simultaneously the progress of reaction was monitored by measuring the produced H atoms with it by reproducing the experimental H atom concentration time profiles a two channel decomposition model of ortho benzyne was developed by investigating the thermal decomposition of phenyl and benzene a complete detailed chemical reaction model was elaborated which is able to capture the measured H atom concentration profiles over the whole investigated parameter range thus the present work may contribute to a better understanding and describing of high temperature combustion of aromatics which are considered as major soot precursors

Thermal Decomposition of Uranyl Sulfate 1960 excerpt from the thermal decomposition of oil shales dissertation submitted in partial fulfillment of the requirements for the degree of doctor of philosophy in the faculty of pure science Columbia University inspissated petroleum little is known as to the origin or nature of kerogen or other organic material in the shale that all of the organic or carbonaceous matter does not produce oil is known 7 E. H. Cunningham Craig attributes the origin of kerogen to inspissated or dried up petroleum he concludes that the oil shale stratum is a former oil bearing formation which under the action of heat has evaporated and dried up leaving petroleum residues which have become insoluble by polymerization 4 other authorities are not inclined to accept this theory as they see no substantial evidence of petroleum having passed through the formation about the publisher forgotten books publishes hundreds of thousands of rare and classic books find more at forgottenbooks.com this book is a reproduction of an important historical work forgotten books uses state of the art technology to digitally reconstruct the work preserving the original format whilst repairing imperfections present in the aged copy in rare cases an imperfection in the original such as a blemish or missing page may be replicated in our edition we do however repair the vast majority of imperfections successfully any imperfections that remain are intentionally left to preserve the state of such historical works

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Changes in the Kinetic Properties of the Thermal Decomposition of KMnO_4 as a Result of Co^{60} -irradiation 1967 this unique book investigates the synthesis kinetics and thermal decomposition properties and processing of energy producing materials used in propellants explosives pyrotechnic and gas generating compositions thermal decomposition and combustion of explosives and propellants provides several mechanisms and stages for the thermal decomposition and combustion reactions of most flammable compounds and their mixtures such as aliphatic and aromatic nitrocompounds nitramines nitroesters organic azides furazanes tetrazols difluoroamines polynitrous heterocycles and onium salts the authors examine the classic problem of the dependence of explosive activity on molecular structure using applications to predict the stability compatibility and the stabilization of explosives and propellant components they also offer experimental results examining factors such as subsurface decomposition evaporation and dispersion of materials which can be used to control combustion of condensed systems providing several approaches to stability safety and controlled combustion of flammable substances thermal decomposition and combustion of explosives and propellants is a multi dimensional resource for graduate students researchers and professionals interested in chemical kinetics the combustion and synthesis of high energy materials criminal forensics and the field of explosives powders and solid rocket propellants

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