

CHAPTER

08

REDOX REACTION

- + The chemical reaction which contain oxidation as well as reduction half reaction is called redox reaction.
- + An atom or ion or molecule which undergoes reduction (gain of electrons) is called oxidant (while an atom or molecule which undergoes oxidation) (loss of electrons) is called reductant.
- + Oxygen shows positive oxidation states (+1 and +2) only in OF_2 and O_2F_2 .
- + Maximum oxidation state of an element never more than its group number.
- + a) Oxidation state of Mn in $KMnO_4$ is +7.
b) Oxidation state of Cr in $K_2Cr_2O_7$ is +6.
c) Oxidation state of Cr in CrO_3 is +6.
- + a) Oxidation state of 'N' in N_3H is -1/3.
b) Oxidation state of 'N' in NH_4NO_3 (NH_4^+ and NO_3^-) are -3 and +5.
- + a) Oxidation state of 'Fe' in $FeSO_4$ is +2.
b) Oxidation state of 'Fe' in Fe_3O_4 is +8/3.
- + In $xMnO_4^- + yH_2O + zI^- \rightarrow 2MnO_2 + 8OH^- + 3I_2$
 $x = 2, y = 4, z = 6$
- + In reaction of $P_4 + xH_2O + yOH^- \rightarrow PH_3 + zH_2PO_2^-$
 $x = 3, y = 3, z = 3$ (i.e. $x = y = z$)
- + $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ is an example for chemical combustion.
- + In all combustion reactions oxygen undergoes reduction (0 to -2).
- + In decomposition reaction chemical compound split into two or more simpler substances.
 $[2H_2O \rightarrow 2H_2 + O_2]$
- + In decomposition of $MgCO_3$, no changes in oxidation numbers. So it is not a redox reaction
 $[MgCO_3 \rightarrow MgO + CO_2]$
- + $Zn_{(s)} + CuSO_{4(aq)} \rightarrow ZnSO_{4(aq)} + Cu_{(s)}$ is a displacement reaction.
- + In disproportionation reaction the same element undergoes both oxidation and reduction simultaneously.
- + When Br_2 and I_2 dissolve in CCl_4 solvent to give reddish brown and purple colours respectively. So, they are detected by extracting into CCl_4 . This is also called "Layer Test".
- + Comproportion is a reverse of disproportionation reaction

Redox Reactions Chapter Study

Katrin Zwirgmaier



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Computational Methods to Study the Structure and Dynamics of Biomolecules and Biomolecular Processes Adam Liwo, 2018-12-19 This book provides a comprehensive overview of modern computer based techniques for analyzing the structure properties and dynamics of biomolecules and biomolecular processes It is organized in four main parts the first one deals with methodology of molecular simulations the second one with applications of molecular simulations the third one introduces bioinformatics methods and the use of experimental information in molecular simulations the last part reports on selected applications of molecular quantum mechanics This second edition has been thoroughly revised and updated to include the latest progresses made in

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Handbook of Environmental Isotope Geochemistry Mark Baskaran, 2011-10-13 Applications of radioactive and stable isotopes have revolutionized our understanding of the Earth and near earth surface processes The utility of the isotopes are ever increasing and our sole focus is to bring out the applications of these isotopes as tracers and chronometers to a wider audience so that they can be used as powerful tools to solve environmental problems New developments in this field remain mostly in peer reviewed journal articles and hence our goal is to synthesize these findings for easy reference for

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A Study of Enzymes, Volume II Stephen A. Kuby, 2024-12-20 This comprehensive monograph consists of two parts Volume I entitled Enzyme Catalysis Kinetics and Substrate Binding and Volume II entitled Mechanism of Enzyme Action Volume I focuses on several aspects of enzyme catalytic behavior their steady state and transient state kinetics and the thermodynamic properties of substrate binding Packed with figures tables schemes and photographs this volume contains over 1 000 references including references regarding enzymology s fascinating history This comprehensive book is of particular interest to enzymology students teachers and researchers Volume II presents selected cutting edge examples of techniques and approaches being pursued in biochemistry This up to date resource includes 11 chapters which illustrate important theoretical and practical aspects of enzyme mechanisms It also features selected examples in which today s most important techniques ideas and theories are used to elaborate on the intricate nature of enzyme action mechanisms This particular volume provides important information for both the novice and the seasoned investigator

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Methods for Studying Nucleic Acid/Drug Interactions

Meni Wanunu, Yitzhak Tor, 2016-04-19 Since most therapeutic efforts have been predominantly focused on pharmaceuticals that target proteins there is an unmet need to develop drugs that intercept cellular pathways that critically involve nucleic acids Progress in the discovery of nucleic acid binding drugs naturally relies on the availability of analytical methods that assess the eff

A Study of Enzymes Stephen A. Kuby, 1990-11-16 This comprehensive monograph consists of two parts Volume I entitled Enzyme Catalysis Kinetics and Substrate Binding and Volume II entitled Mechanism of Enzyme Action Volume I focuses on several aspects of enzyme catalytic behavior their steady state and transient state kinetics and the thermodynamic properties of substrate binding Packed with figures tables schemes and photographs this volume contains over 1 000 references including references regarding enzymology s fascinating history This comprehensive book is of particular interest to enzymology students teachers and researchers Volume II presents selected cutting edge examples of techniques and approaches being pursued in biochemistry This up to date resource includes 11 chapters which illustrate important theoretical and practical aspects of enzyme mechanisms It also features selected examples in which today s most important techniques ideas and theories are used to elaborate on the intricate nature of enzyme action mechanisms This particular volume provides important information for both the novice and the seasoned investigator

Undergraduate Instrumental Analysis Thomas J. Bruno, James W. Robinson, George M. Frame II, Eileen M. Skelly Frame, 2023-07-31 Analytical instrumentation is crucial to research in molecular biology medicine geology food science materials science forensics and many other fields Undergraduate Instrumental Analysis 8th Edition provides the reader with an understanding of all major instrumental analyses and is unique in that it starts with the fundamental principles and then develops the level of sophistication that is needed to make each method a workable tool for the student Each chapter includes a discussion of the fundamental principles underlying each technique detailed descriptions of the instrumentation and a large number of applications Each chapter includes an updated bibliography and problems and most chapters have suggested experiments appropriate to the technique This edition has been completely updated revised and expanded The order of presentation has been changed from the 7th edition in that after the introduction to spectroscopy UV Vis is discussed This order is more in keeping with the preference of most instructors Naturally once the fundamentals are introduced instructors are free to change the order of presentation Mathematics beyond algebra is kept to a minimum but for the interested student in this edition we provide an expanded discussion of measurement uncertainty that uses elementary calculus although a formula approach can be used with no loss of context Unique among all instrumental analysis texts we explicitly discuss safety up front in Chapter 2 The presentation intentionally avoids a finger wagging thou shalt not approach in favor of a how to

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