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thermodynamics than thermodynamics ever did for the steam engine. Although analysis of devices like steam engines, combustion engines, refrigerators, etc., are important, thermodynamics has much wider applicability.

Selected Thermodynamic and Thermochemical Data B. Exact Differential Equations C. Gaskell received a B. He was recruited in to Purdue University at the rank of Professor where he taught until He has authored more than technical publications in the field of phase transformations, physical metallurgy, and magnetic materials, and has edited or coedited seven books including the fifth edition of Physical Metallurgy, and has been awarded 12 patents. Reviews "I love this book and will strongly recommend it to my students. It is an excellent textbook for undergraduate students who are studying in materials science. Each chapter contains a summary and nearly every chapter provides detailed examples. The new edition includes additional thermodynamic work terms beyond pdV or Tds or udN such as magnetic work and how the fields within these work terms are experimentally relevant. The thermodynamic consideration of magnetic materials is particularly useful for graduate students working on magnetic materials. I find the effect of magnetism and magnetic work in the analysis very useful. The introduction of Magnetic flavor in this textbook set it apart from other books on thermodynamics of materials" â€”Oh Joo Tien, Nanyang Technological University, Singapore "This book gives a step-by-step introduction to the thermodynamics of materials. Many examples are laid out in details, and numerous diagrams are given to make sure that a solid understanding is reached. Therefore, this book gives solid foundations in thermodynamics for engineering students. Equipped with this knowledge, the students can go on toward more specialized studies or to the reading of research papers. It would be ideal for undergraduate students who are learning this topic for the first time, but is also useful as a refresher of the fundamentals for graduate students and researchers working in this field. The inclusion of worked examples and problems is particularly valuable in helping to practice the application of thermodynamic theory to real examples in Materials Science. This book can easily bring them to enter the world of Thermodynamics of Materials and make them well know concept about Thermodynamics. I believe the emphasis on graphical representations of thermodynamic data is a very real strength for interpreting this material to the beginner. I also see significant improvements in the organization that provides greater clarity. The addition of qualitative example problems at the end of each chapter is welcome. The new Chapter 15 is a valuable contribution. This chapter is probably unlikely to be used in undergraduate teaching, but it will be extremely useful for a new generation of graduate students. Gaskell and David E. Laughlin, is the need of the hour. Although Professor Gaskell is not among us physically to inspire us, his legacy will be seen whenever we open this book on thermodynamics of materials. A great effort from Professor Laughlin in bringing out this revised edition. Rajulapati, University of Hyderabad, India "This textbook has a very rigorous and deep approach to chemical thermodynamics. It is very clear in explaining the complex meaning of the thermodynamics rules and equations, starting from the potentials and their use to solve thermodynamics problems. Without being too advanced, it reaches all the necessary points for a thorough discussion of the matter, even entering in some detail which is not often taught in the undergraduate courses, I really appreciate the clarity and the accuracy of the language. The new edition is reorganized into three major sections to align the book for practical coursework, with the first Thermodynamic Principles and second Phase Equilibria sections aimed at use in a one semester undergraduate course. The third section Reactions and Transformations can be used in other courses of the curriculum that deal with oxidation, energy, and phase transformations. The book is updated to include the role of work terms other than PV work e. There is also an increased emphasis on the thermodynamics of phase transformations and the Sixth Edition features an entirely new chapter 15 that links specific thermodynamic applications to the study of phase transformations. The book also features more than 50 new end of chapter problems and more than 50 new figures.

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Chapter 2 : Introduction to the Thermodynamics of Materials - CRC Press Book

Gaskell authored the textbooks Introduction to Metallurgical Thermodynamics, Introduction to the Thermodynamics of Materials, and Introduction to Transport Phenomena in Materials Engineering. David E. Laughlin is the ALCOA Professor of Physical Metallurgy in the Department of Materials Science and Engineering of CMU and also has a courtesy.

Subjects Description Maintaining the substance that made Introduction to the Thermodynamic of Materials a perennial best seller for decades, this Sixth Edition is updated to reflect the broadening field of materials science and engineering. The new edition is reorganized into three major sections to align the book for practical coursework, with the first Thermodynamic Principles and second Phase Equilibria sections aimed at use in a one semester undergraduate course. The third section Reactions and Transformations can be used in other courses of the curriculum that deal with oxidation, energy, and phase transformations. The book is updated to include the role of work terms other than PV work e. There is also an increased emphasis on the thermodynamics of phase transformations and the Sixth Edition features an entirely new chapter 15 that links specific thermodynamic applications to the study of phase transformations. The book also features more than 50 new end of chapter problems and more than 50 new figures. Reviews "I love this book and will strongly recommend it to my students. It is an excellent textbook for undergraduate students who are studying in materials science. Each chapter contains a summary and nearly every chapter provides detailed examples. The new edition includes additional thermodynamic work terms beyond pdV or Tds or udN such as magnetic work and how the fields within these work terms are experimentally relevant. The thermodynamic consideration of magnetic materials is particularly useful for graduate students working on magnetic materials. I find the effect of magnetism and magnetic work in the analysis very useful. The introduction of Magnetic flavor in this textbook set it apart from other books on thermodynamics of materials" â€”Oh Joo Tien, Nanyang Technological University, Singapore "This book gives a step-by-step introduction to the thermodynamics of materials. Many examples are laid out in details, and numerous diagrams are given to make sure that a solid understanding is reached. Therefore, this book gives solid foundations in thermodynamics for engineering students. Equipped with this knowledge, the students can go on toward more specialized studies or to the reading of research papers. It would be ideal for undergraduate students who are learning this topic for the first time, but is also useful as a refresher of the fundamentals for graduate students and researchers working in this field. The inclusion of worked examples and problems is particularly valuable in helping to practice the application of thermodynamic theory to real examples in Materials Science. This book can easily bring them to enter the world of Thermodynamics of Materials and make them well know concept about Thermodynamics. I believe the emphasis on graphical representations of thermodynamic data is a very real strength for interpreting this material to the beginner. I also see significant improvements in the organization that provides greater clarity. The addition of qualitative example problems at the end of each chapter is welcome. The new Chapter 15 is a valuable contribution. This chapter is probably unlikely to be used in undergraduate teaching, but it will be extremely useful for a new generation of graduate students. Gaskell and David E. Laughlin, is the need of the hour. Although Professor Gaskell is not among us physically to inspire us, his legacy will be seen whenever we open this book on thermodynamics of materials. A great effort from Professor Laughlin in bringing out this revised edition. Rajulapati, University of Hyderabad, India "This textbook has a very rigorous and deep approach to chemical thermodynamics. It is very clear in explaining the complex meaning of the thermodynamics rules and equations, starting from the potentials and their use to solve thermodynamics problems. Without being too advanced, it reaches all the necessary points for a thorough discussion of the matter, even entering in some detail which is not often taught in the undergraduate courses, I really appreciate the clarity and the accuracy of the language.

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