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Titolo	Chemical Thermodynamics in Materials Science [[electronic resource]] : From Basics to Practical Applications / / by Taishi Matsushita, Kusuhiro Mukai
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Disciplina	620.11
Soggetti	Metals Physical chemistry Thermodynamics Heat engineering Heat transfer Mass transfer Structural materials Metallic Materials Physical Chemistry Engineering Thermodynamics, Heat and Mass Transfer Structural Materials
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Symbols and glossary -- The first law of thermodynamics -- Enthalpy, H -- The second law of thermodynamics -- Entropy, S -- Equilibrium conditions -- Chemical potential and activity -- Partial molar quantities and excess quantities -- Gibbs energy change,G,and standard Gibbs energy change,G -- Introduction to computational thermodynamics -- Books, databases, and software -- Thermodynamic data.
Sommario/riassunto	This textbook covers chemical thermodynamics in materials science from basic to advanced level, especially for iron and steel making processes. To improve a process by applying knowledge of

thermodynamics or to assess the calculation results of thermodynamic software, an accurate and systematic understanding of thermodynamics is required. For that purpose, books from which one can learn thermodynamics from the basic to the advanced level are needed, but such books are rarely published. This book bridges the gap between the basics, which are treated in general thermodynamic books, and their application, which are only partially dealt with in most specialized books on a specific field. This textbook can be used to teach the basics of chemical thermodynamics and its applications to beginners. The basic part of the book is written to help learners acquire robust applied skills in an easy-to-understand manner, with in-depth explanations and schematic diagrams included. The same book can be used by advanced learners as well. Those higher-level readers such as post-graduate students and researchers may refer to the basic part of the book to get down to the basic concepts of chemical thermodynamics or to confirm the basic concepts. Abundant pages are also devoted to applications designed to present more advanced applied skills grounded in a deep understanding of the basics. The book contains some 50 examples and their solutions so that readers can learn through self-study. .