

1. Record Nr.	UNINA9910830671503321
Autore	Cornell R. M
Titolo	The iron oxides [[electronic resource] ] : structure, properties, reactions, occurrences, and uses // R.M. Cornell, U. Schwertmann
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, 2003
ISBN	1-280-56077-0 9786610560776 3-527-60644-0 3-527-60209-7
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (706 p.)
Altri autori (Persone)	SchwertmannUdo
Disciplina	542.6212 546/.6212
Soggetti	Iron oxides
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 553-646) and index.
Nota di contenuto	The Iron Oxides; Contents; Preface to the Second Edition; Preface to the First Edition; Abbreviations; Colour Plates; 1 Introduction to the iron oxides; 2 Crystal structure; 2.1 General; 2.2 Iron oxide structures; 2.2.1 Close packing of anion layers; 2.2.2 Linkages of octahedra or tetrahedra; 2.3 Structures of the individual iron oxides; 2.3.1 The oxide hydroxides; 2.3.1.1 Goethite -FeOOH; 2.3.1.2 Lepidocrocite -FeO(OH); 2.3.1.3 Akaganeite -FeO(OH) and schwertmannite Fe(16)O(16)(OH)(y)(SO(4))(z) · n H(2)O; 2.3.1.4 -FeOOH and -FeOOH (feroxyhyte); 2.3.1.5 High pressure FeOOH 2.3.1.6 Ferrihydrite2.3.2 The Hydroxides; 2.3.2.1 Bernalite Fe(OH)(3) · nH(2)O; 2.3.2.2 Fe(OH)(2); 2.3.2.3 Green rusts; 2.3.3 The Oxides; 2.3.3.1 Hematite -Fe(2)O(3); 2.3.3.2 -Fe(2)O(3); 2.3.3.3 Magnetite Fe(3)O(4); 2.3.3.4 Maghemite -Fe(2)O(3); 2.3.3.5 Wustite Fe(1-x)O; 2.4 The Fe-Ti oxide system; Appendix; 3 Cation substitution; 3.1 General; 3.2 Goethite and lepidocrocite; 3.2.1 Al substitution; 3.2.2 Other substituting cations; 3.3 Hematite; 3.3.1 Al substitution; 3.3.2 Other cations; 3.4 Magnetite and maghemite; 3.5 Other Iron oxides; 4 Crystal morphology and size; 4.1 General 4.1.1 Crystal growth4.1.2 Crystal morphology; 4.1.3 Crystal size; 4.2

The iron oxides; 4.2.1 Goethite; 4.2.1.1 General; 4.2.1.2 Domainic character; 4.2.1.3 Twinning; 4.2.1.4 Effect of additives; 4.2.2 Lepidocrocite; 4.2.3 Akaganeite and schwertmannite; 4.2.4 Ferrihydrite; 4.2.5 Hematite; 4.2.6 Magnetite; 4.2.7 Maghemite; 4.2.8 Other Iron Oxides; 5 Surface area and porosity; 5.1 Surface Area; 5.2 Porosity; 5.3 Surface Roughness and Fractal Dimensions; 5.4 The iron oxides; 5.4.1 Goethite; 5.4.2 Lepidocrocite; 5.4.3 Akaganeite and schwertmannite; 5.4.4 -FeOOH and feroxyhyte; 5.4.5 Ferrihydrite 5.4.6 Hematite 5.4.7 Magnetite; 5.4.8 Maghemite; 6 Electronic, electrical and magnetic properties and colour; 6.1 Electronic properties; 6.1.1 Free Fe(3+) and Fe(2+) ions; 6.1.2 Bound Fe ions; 6.1.3 Molecular orbital description of bonding in iron oxides; 6.2 Electrical properties; 6.2.1 Semiconductor properties of iron oxides; 6.3 Magnetic properties; 6.3.1 Basic definitions; 6.3.2 Types of magnetism (Fig. 6.5); 6.3.3 Magnetic behaviour of iron oxides; 6.3.4 The different iron oxides; 6.3.4.1 Goethite; 6.3.4.2 Lepidocrocite; 6.3.4.3 Akaganeite 6.3.4.4 -FeOOH, feroxyhyte and high pressure FeOOH 6.3.4.5 Ferrihydrite; 6.3.4.6 Hematite; 6.3.4.7 Magnetite and Maghemite; 6.3.4.8 Other Fe oxides; 6.4 Colour; 6.4.1 General; 6.4.2 Colours; 6.4.3 Pigment properties; 7 Characterization; 7.1 Introduction; 7.2 Infrared spectroscopy; 7.2.1 Goethite; 7.2.2 Lepidocrocite; 7.2.3 Ferrihydrite; 7.2.4 Hematite; 7.2.5 Other iron oxides; 7.3 Raman spectroscopy; 7.4 Ultraviolet-visible spectroscopy; 7.4.1 General; 7.4.2 Spectra of the different Fe oxides; 7.5 Mossbauer spectroscopy; 7.5.1 General; 7.5.2 Spectra of the various Fe oxides 7.5.2.1 Goethite and Lepidocrocite

---

## Sommario/riassunto

This book brings together in one, compact volume all aspects of the available information about the iron oxides. It presents a coherent, up to date account of the properties, reactions and mechanisms of formation of these compounds. In addition, there are chapters dealing with iron oxides in rocks and soils, as biominerals and as corrosion products together with methods of synthesis and the numerous application of these compounds. Their role in the environment is also discussed. The authors are experts in the field of iron oxides and have worked on all the topics covered. Much recent data from

---