

1. Record Nr.	UNINA9910144332303321
Autore	Schwertmann Udo
Titolo	Iron oxides in the laboratory : preparation and characterization // U. Schwertmann, R.M. Cornell
Pubbl/distr/stampa	Weinheim, [Germany] : , : Wiley-VCH, , 2000 ©2000
ISBN	1-281-84246-X 9786611842468 3-527-61322-6 3-527-61323-4
Edizione	[Second, completely revised and extended edition.]
Descrizione fisica	1 online resource (209 p.)
Disciplina	546.6212 546/.6212
Soggetti	Iron oxides Electronic books.
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 and index.
Nota di contenuto	Iron Oxides in the Laboratory; Contents; Introduction; 1 The Iron Oxides; 1.1 The Major Iron Oxides; 1.2 Less Common or Rare Iron Oxides; 1.3 Iron Oxides in the Environment; 2 General Preparative Techniques; 2.1 Quantity of Product; 2.2 Treatment after Synthesis; 2.2.1 Washing; 2.2.2 Drying; 2.2.3 Storage; 2.3 Chemical Analysis; 2.3.1 Total Analysis; 2.3.2 Extent of Isomorphous Substitution; 2.3.3 Impurities; 2.4 Removal of Iron Oxides from Reaction Vessels; 2.5 Purity of Reagents; 3 Methods of Characterization; 3.1 Introduction; 3.2 Color (A. Scheinost); 3.2.1 Origin of Color 3.2.2 Color Measurement 3.2.3 Color Systems; 3.2.4 Identification of Iron Oxides by Color and Crystal-Field Bands; 3.3 X-Ray Powder Diffraction; 3.4 Microscopy; 3.5 Surface Area, Porosity and Fractal Dimensions; 3.6 Acid Oxalate Extraction; 3.7 Infrared Spectroscopy; 3.8 Thermoanalysis; 3.9 Mossbauer Spectroscopy; 4 Synthesis Pathways; 4.1 Nucleation and Crystal Growth; 4.1.1 Nucleation; 4.1.2 Crystal Growth; 4.1.3 Production of Monodispersed Particles; 4.1.4 Production of Nanoparticles; 4.2 Main Routes of Synthesis; 4.2.1 Hydrolysis of

Acidic Solutions of FeIII Salts

4.2.2 Transformation of Ferrihydrite; 4.2.3 Oxidative Hydrolysis of FeII Salts; 4.2.4 Phase Transformations; 4.2.5 The Gel-Sol Method; 4.2.6 Hydrothermal Precipitation; 4.2.7 Decomposition of Metal Chelates; 5 Goethite; 5.1 Introductions; 5.2 Pure Goethite from FeIII Systems; 5.2.1 Preparation from an Alkaline System (acc. to Bohm. 1925); 5.2.2 Preparation from an Acid System (acc. to Mørup et al., 1983); 5.2.3 Preparation From a Cysteine/2-line Ferrihydrite System; 5.3 Pure Goethite from an FeII System; 5.4 General Comments; 5.5 Metal (M)-Substituted Goethites $Fe_{1-x}M_xOOH$
5.5.1 Al-Substituted Goethite $Fe_{1-x}Al_xOOH$
5.5.1.1 Preparation from an Alkaline FeIII System; 5.5.1.2 Preparation from an FeII-System; 5.5.2 Cr-Substituted Goethite $Fe_{1-x}Cr_xOOH$; 5.5.3 Mn-Substituted Goethite $Fe_{1-x}Mn_xOOH$; 5.5.4 V-Substituted Goethite $Fe_{1-x}V_xOOH$; 6 Lepidocrocite; 6.1 Introduction; 6.2 Preparation; 6.3 Other Methods; 7 Feroxyhyte; 7.1 Introduction; 7.2 Preparation; 8 Ferrihydrite; 8.1 Introduction; 8.2 6-Line Ferrihydrite; 8.3 2-Line Ferrihydrite; 8.4 Ferrihydrites with a Range of Crystallinities (acc. to D. G. Lewis); 9 Akaganeite; 9.1 Introduction
9.2 Preparation by Hydrolysis of Acidic $FeCl_3$ Solutions (Somatoids)
9.3 Preparation by Hydrolysis of a Partially Neutralized $FeCl_3$ solution (Rod-like Crystals); 9.4 Si-containing Akaganeite; 10 Hematite; 10.1 Introduction; 10.2 Preparation by Forced Hydrolysis of FeIII Salt Solutions; 10.3 Preparation by Transformation of 2-Line Ferrihydrite; 10.4 Monodisperse Hematites of Different Crystal Shapes; 10.5 Other Methods; 10.6 Al-substituted Hematite; 10.7 Coated Hematite; 11 Magnetite; 11.1 Introduction; 11.2 Preparation by Oxidation of a FeII Solution; 11.3 Cation-substituted Magnetites
12 Maghemite

Sommario/riassunto

Iron Oxides play an important role in numerous disciplines. Since the publication of the first edition, there has been a surge of interest in synthetic fine to ultrafine iron oxides in a wide range of scientific and technological disciplines, especially in mineralogy, geosciences and environmental science and in various branches of technology. As before, the main aim of the second edition is to present reliable, well-tested, up-to-date methods of synthesizing pure iron oxides. The section on monodispersed particles, presently of great interest to industry, has been expanded. Furthermore the me