Landolt-Börnstein
Numerical Data and Functional Relationships in Science and Technology
New Series / Editor in Chief: W. Martienssen

Group III: Condensed Matter
Volume 27

Magnetic Properties of Non-Metallic Inorganic Compounds Based on Transition Elements

Subvolume B 7

Pnictides and chalcogenides III (Binary non-equiatomic actinide pnictides and chalcogenides)

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Springer

ISSN 1615-1925 (Condensed matter)

ISBN 3-540-42996-4 Springer Berlin Heidelberg New York

Library of Congress Cataloging in Publication Data
Zahlenwerte und Funktionen aus Naturwissenschaften und Technik, Neue Serie
Editor in Chief: W. Martienssen
Vol. III/27B7: Editor: H.P.J. Wijn
At head of title: Landolt-Börnstein. Added t.p.: : Numerical data and functional relationships in science and technology.
Tables chiefly in English.
Intended to supersede the Physikalisch-chemische Tabellen by H. Landolt and R. Börnstein of which the 6th ed. began publication in 1950 under title: Zahlenwerte und Funktionen aus Physik, Chemie, Astronomie, Geophysik und Technik.
Vols. published after v. 1 of group I have imprint: Berlin, New York, Springer-Verlag
Includes bibliographies.
1. Physics--Tables. 2. Chemistry--Tables. 3. Engineering--Tables.
I. Börnstein, R. (Richard), 1852-1913. II. Landolt, H. (Hans), 1831-1910.
III. Physikalisch-chemische Tabellen. IV. Title: Numerical data and functional relationships in science and technology.
QC61.23 502'.12 62-53136

Springer-is a part of Springer Science+Business Media
springeronline.com

Printed in Germany

Cover layout: Erich Kirchner, Heidelberg
Typesetting: Authors and Redaktion Landolt-Börnstein, Darmstadt
Printing and binding:: AZ-Druck, Kempten
SPIN: 10836796 63/3020 - 5 4 3 2 1 0 – Printed on acid-free paper

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Preface

The Landolt-Börnstein Volume 27 deals with the magnetic properties of non-metallic inorganic compounds based on transition elements, such as there are pnictides, chalcogenides, oxides, halides, borates, silicates and phosphates. A preliminary survey of the contents of all subvolumes that have already appeared or have been planned to appear is printed on the inside of the front cover.

In order to cover the large amount of magnetic and magnetically related properties of the lanthanide and actinide pnictides and chalcogenides that appeared in literature in recent years, the subvolume 27B had to be split into subvolumes B1...B8. Subvolumes 27B1, 27B2 and 27B3, 27B4 (published in 1998, 2000 and 2003) deal with lanthanide monopnictides, monochalcogenides, binary lanthanide polypnictides and polychalcogenides, and ternary lanthanide pnictides (containing at least one transition element), respectively. In subvolume 27B5 (published in 2003) the magnetic properties of ternary lanthanide chalcogenides containing at least one d-electron element are reported as well as lanthanide pnictides and chalcogenides containing at least one s-, p- or f-electron element. Data on oxypnictides and layer-structured misfit compounds are also included in 27B5. For the magnetic properties of pnictides and chalcogenides based on 3d transition elements as a main component is referred to subvolume 27A (published in 1988).

The three subvolumes 27B6, 27B7 and 27B8 cover the properties of actinide pnictides and chalcogenides. Subvolume 27B8 (published in 2004) deals with ternary actinide pnictides and chalcogenides. The present subvolume 27B7 deals with binary non-equiatomic actinide pnictides and chalcogenides.

Pnictides are defined as compounds containing at least one of the elements P, As, Sb or Bi (V-th group of the periodic system) and chalcogenides are defined as compounds containing one of the elements S, Se or Te (VI-th group of the periodic system).

Binary actinide pnictides and chalcogenides form a large family of phases with different crystal and magnetic structures and a variety of physical properties. In this presentation the authors have reviewed thoroughly and as complete as possible all magnetic and related properties that have been determined by many studies up to the beginning of 2004.

An index of substances at the end of this subvolume lists all binary actinide pnictides and chalcogenides treated in this subvolume and will help the user to identify quickly the information on the individual substances he is looking for.

Many thanks are due to the authors for the agreeable cooperation, the Landolt-Börnstein editorial office in Darmstadt, especially Dr. W. Polzin and Ms. R. Brangs, for the great help with the editorial work, and to Springer Verlag for their thoughtful help in the final preparation of this volume.

Aachen, August 2004 **The Editor**

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Definitions, units and conversion factors

In the SI, units are given for both defining relations of the magnetization, $\boldsymbol{B} = \mu_0(\boldsymbol{H} + \boldsymbol{M})$ and $\boldsymbol{B} = \mu_0\boldsymbol{H} + \boldsymbol{M}$, respectively. $\mu_0 = 4\pi\cdot10^{-7}$ Vs A^{-1} m^{-1}, A: molar mass, ρ: mass density, $\boldsymbol{P}$: magnetic moment, $\boldsymbol{M}$: magnetic moment per unit volume (magnetization, magnetic polarization).

Quantity	cgs/emu	SI	
$\boldsymbol{B}$	G = (erg $cm^{-3})^{1/2}$	T = Vs m^{-2}	
	1 G $\hat{=}$	10^{-4} T	
$\boldsymbol{H}$	1 Oe = (erg $cm^{-3})^{1/2}$	A m^{-1}	
	1 Oe $\hat{=}$	$10^3/4\pi$ A m^{-1}	
$\boldsymbol{M}$	$\boldsymbol{B} = \boldsymbol{H} + 4\pi\boldsymbol{M}$	$\boldsymbol{B} = \mu_0(\boldsymbol{H} + \boldsymbol{M})$	$\boldsymbol{B} = \mu_0\boldsymbol{H} + \boldsymbol{M}$
	G	A m^{-1}	T
	1 G $\hat{=}$	10^3 A m^{-1}	$4\pi\cdot10^{-4}$ T
$\boldsymbol{P}$	$\boldsymbol{P} = \boldsymbol{M}V$	$\boldsymbol{P} = \boldsymbol{M}V$	$\boldsymbol{P} = \boldsymbol{M}V$
	G cm^3	A m^2	V s m
	1 G cm^3 $\hat{=}$	10^{-3} A m^2	$4\pi\cdot10^{-10}$ V s m
σ	$\sigma = M/\rho$	$\sigma = M/\rho$	$\sigma = M/\rho$
	G cm^3 g^{-1}	A m^2 kg^{-1}	V s m kg^{-1}
	1 G cm^3 g^{-1} $\hat{=}$	1 A m^2 kg^{-1}	$4\pi\cdot10^{-7}$ V s m kg^{-1}
σ_m	$\sigma_m = \sigma A$	$\sigma_m = \sigma A$	$\sigma_m = \sigma A$
	G cm^3 mol^{-1}	A m^2 mol^{-1}	V s m mol^{-1}
	1 G cm^3 mol^{-1} $\hat{=}$	10^{-3} A m^2 mol^{-1}	$4\pi\cdot10^{-10}$ V s m mol^{-1}
χ	$\boldsymbol{P} = \chi\boldsymbol{H}$	$\boldsymbol{P} = \chi\boldsymbol{H}$	$\boldsymbol{P} = \chi\mu_0\boldsymbol{H}$
	cm^3	m^3	m^3
	1 cm^3 $\hat{=}$	$4\pi\cdot10^{-6}$ m^3	$4\pi\cdot10^{-6}$ m^3
χ_v	$\chi_v = \chi/V$	$\chi_v = \chi/V$	$\chi_v = \chi/V$
	cm^3 cm^{-3}	m^3 m^{-3}	m^3 m^{-3}
	1 cm^3 cm^{-3} $\hat{=}$	4π m^3 m^{-3}	4π m^3 m^{-3}
χ_g	$\chi_g = \chi_v/\rho$	$\chi_g = \chi_v/\rho$	$\chi_g = \chi_v/\rho$
	cm^3 g^{-1}	m^3 kg^{-1}	m^3 kg^{-1}
	1 cm^3 g^{-1} $\hat{=}$	$4\pi\cdot10^{-3}$ m^3 kg^{-1}	$4\pi\cdot10^{-3}$ m^3 kg^{-1}
χ_m	$\chi_m = \chi_g A$	$\chi_m = \chi_g A$	$\chi_m = \chi_g A$
	cm^3 mol^{-1}	m^3 mol^{-1}	m^3 mol^{-1}
	1 cm^3 mol^{-1} $\hat{=}$	$4\pi\cdot10^{-6}$ m^3 mol^{-1}	$4\pi\cdot10^{-6}$ m^3 mol^{-1}

Experimental errors

In this volume, experimental errors are given in parentheses referring to the last decimal places. For example, 1.352(12) stands for 1.352 ± 0.012, and 342.5(21) stands for 342.5 ± 2.1.