

Landolt-Börnstein

Numerical Data and Functional Relationships in Science and Technology

New Series / Editors in Chief: O. Madelung and W. Martienssen

Group III: Solid State Physics

Volume 27

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

Subvolume f 3

Perovskites II, Oxides with Corundum,
Ilmenite and Amorphous Structures

Y. Endoh, K. Kakurai, A.K. Katori, M.S. Seehra, G. Srinivasan, H.P.J. Wijn

Edited by H.P.J. Wijn

Springer-Verlag

Berlin Heidelberg New York

London Paris Tokyo

Hong Kong Barcelona Budapest

Table of contents

Magnetic properties of non-metallic inorganic compounds based on transition elements Subvolume III/27f3: Perovskites II, oxides with corundum, ilmenite and amorphous structures

5	Magnetic properties of oxides with perovskite, corundum, ilmenite and amorphous structures	1
	(Chap. 5.1 - 5.3 see subvolume III/27f1, chap. 5.4 see subvolume III/27f2)	
5.5	Perovskite-type oxides RMO_3 (R = rare earth element, M = 3d element or Al) (H.P.J. WIJN)	1
5.5.1	Introduction	1
5.5.1.1	General remarks	1
5.5.1.2	Magnetic configurations	2
5.5.1.3	List of frequently used symbols and abbreviations	5
5.5.2	RAlO_3 compounds	8
5.5.3	RScO_3 compounds	22
5.5.4	RTiO_3 compounds	25
5.5.5	RVO_3 compounds	46
5.5.6	RCrO_3 compounds	56
5.5.7	RMnO_3 compounds	91
5.5.8	RFeO_3 compounds	101
5.5.8.1	LaFeO_3 compounds	104
5.5.8.2	CeFeO_3	107
5.5.8.3	PrFeO_3	107
5.5.8.4	NdFeO_3 compounds	108
5.5.8.5	SmFeO_3 compounds	110
5.5.8.6	EuFeO_3 compounds	116
5.5.8.7	GdFeO_3 compounds	118
5.5.8.8	TbFeO_3 compounds	120
5.5.8.9	DyFeO_3 compounds	125
5.5.8.10	HoFeO_3 compounds	134
5.5.8.11	ErFeO_3 compounds	138
5.5.8.12	TmFeO_3 compounds	143
5.5.8.13	YbFeO_3	146
5.5.8.14	LuFeO_3 compounds	146
5.5.8.15	YFeO_3 compounds	147
5.5.9	RCoO_3 compounds	152
5.5.10	RNiO_3 compounds	158
5.5.11	References for 5.5	159
5.6	Oxides with corundum and ilmenite structures (Y. ENDOH, K. KAKURAI, A.K. KATORI)	173
5.6.1	Introduction	173
5.6.2	List of frequently used symbols and abbreviations	173
5.6.3	Oxides with corundum structure	176
5.6.3.1	Binary oxides M_2O_3 ; M = 3d transition element	177
5.6.3.2	Pseudo-binary and ternary oxides $(\text{M}_{1-x}\text{M}'_x)_2\text{O}_3$; M, M' = 3d transition elements . . .	190

5.6.4	Oxides with ilmenite structure	205
5.6.4.1	Single ternary oxides $MM'O_3$; M, $M' = 3d$ transition elements	205
5.6.4.2	Mixed pseudo-ternary Ti oxides $(M_xM'_{1-x})TiO_3$; M, $M' = Mn, Fe, Co$ or Ni	221
5.6.5	Solid solutions between oxides with corundum and ilmenite structure	233
5.6.6	References for 5.6	235
5.7	Amorphous oxides (M.S. SEEHRA, G. SRINIVASAN)	239
5.7.1	Introduction	239
5.7.1.0	Scope of the review	239
5.7.1.1	Symbols and abbreviations	240
5.7.2	Oxide glasses	242
5.7.2.0	General remarks	242
5.7.2.1	Phosphate glasses	242
5.7.2.1.0	General remarks	242
5.7.2.1.1	Ti - based phosphates	243
5.7.2.1.2	V - based phosphates	244
5.7.2.1.3	Cr - based phosphates	244
5.7.2.1.4	Mn - based phosphates	246
5.7.2.1.5	Fe - based phosphates	246
5.7.2.1.6	Co - based phosphates	247
5.7.2.1.7	Spinel ferrite based phosphates	248
5.7.2.2	Borate glasses	249
5.7.2.2.0	General remarks	249
5.7.2.2.1	Mn - borate glasses	250
5.7.2.2.2	Fe - alkali - borate glasses	252
5.7.2.2.3	Fe - BaO - borate glasses	253
5.7.2.2.4	Fe - CaO - borate glasses	256
5.7.2.3	Silicate glasses	259
5.7.2.3.0	General remarks	259
5.7.2.3.1	Mn - aluminosilicate glasses	259
5.7.2.3.2	Mixed-valence Fe - silicate glasses	261
5.7.2.3.3	Ferrous - silicate glasses	263
5.7.2.3.4	Co - aluminosilicate glasses	264
5.7.3	Amorphous oxides prepared by various techniques	267
5.7.3.1	Amorphous 3d oxides	267
5.7.3.1.0	General remarks	267
5.7.3.1.1	Cr - oxides	267
5.7.3.1.2	Fe (ferric) - oxides	267
5.7.3.2	Mixed binary oxides	269
5.7.3.2.0	General remarks	269
5.7.3.2.1	Amorphous garnets	270
5.7.3.2.2	Other mixed oxides	275
5.7.3.2.2.1	$ZnFe_2O_4$	275
5.7.3.2.2.2	$Fe_{0.69}Ga_{1.37}O_3$	276
5.7.3.2.2.3	$(Fe_2O_3)_x(SrO)_{1-x}$	278
5.7.3.2.2.4	$(Fe_2O_3)_x(Bi_2O_3)_{1-x}$	279
5.7.3.2.2.5	$CoFe_2O_4$	281
5.7.3.2.2.6	$CuFe_2O_4$	282
5.7.3.2.2.7	Bi_2CuO_4	284
5.7.3.3	Fe_2O_3 - Bi_2O_3 - based ternary oxides	285
5.7.3.3.0	General remarks	285
5.7.3.3.1	$Fe_2O_3 \cdot Li_2O \cdot Bi_2O_3$ oxides	286
5.7.3.3.2	$Fe_2O_3 \cdot K_2O \cdot Bi_2O_3$ oxides	289
5.7.3.3.3	$Fe_2O_3 \cdot CaO \cdot Bi_2O_3$ oxides	290
5.7.3.3.4	$Fe_2O_3 \cdot ZnO \cdot Bi_2O_3$ oxides	295

5.7.3.3.5	$\text{Fe}_2\text{O}_3 \cdot \text{CuO} \cdot \text{Bi}_2\text{O}_3$ oxides	301
5.7.3.3.6	$\text{Fe}_2\text{O}_3 \cdot \text{Bi}_2\text{O}_3 \cdot \text{ABO}_3$ oxides	307
5.7.4	Theoretical status	315
5.7.5	References for 5.7	317