

**Landolt-Börnstein**  
**Group III: Condensed Matter**

**Volume 30**  
**High Frequency Properties of Dielectric Crystals**

**Subvolume B**  
**Nonlinear Dielectric Susceptibilities**

	Introductory material	
1 - 2	See Vol. 29A	
3 - 4	See Vol. 29B	
5	See Vol. 30A	
6	Nonlinear dielectric susceptibilities (F. CHARRA, G. GURZADYAN)	1
6.1	Introduction	1
6.1.1	Symbols and abbreviations	1
6.1.1.1	Symbols	1
6.1.1.2	Abbreviations	2
6.1.1.3	Crystal-name abbreviations	3
6.1.1.4	Crystal common names	5
6.1.2	About the new tables	6
6.1.3	Dielectric constitutive relations	6
6.1.4	Time- and frequency-related properties of dielectric susceptibilities	9
6.1.4.1	Intrinsic symmetries	9
6.1.4.2	Energy exchange through nonlinear dielectric susceptibility	10
6.1.4.3	Pulsed regime properties	11
6.1.5	Tensor properties of dielectric susceptibilities	11
6.2	Physical origin and methods of measurement of nonlinear dielectric susceptibilities	17
6.2.1	Different optical processes and their physical origin	17
6.2.1.1	First-order (linear) effects	18
6.2.1.2	Second-order effects	18
6.2.1.3	Third-order effects	20
6.2.1.4	Higher-order effects	22
6.2.2	Methods of measurement	23
6.2.2.1	Second-order effects	23
6.2.2.2	Third-order effects	25
6.3	Wave propagation in nonlinear media	26
6.3.1	Three-wave interactions	26
6.3.2	Uniaxial crystals	27
6.3.3	Biaxial crystals	29
6.3.4	Effective nonlinearity	32
6.3.5	Frequency conversion in crystals	34
6.4	How to use the tables	36
6.5	Second-order nonlinear dielectric susceptibilities	38
6.5.1	Cubic	38
6.5.1.1	Point group: $(-4)3m$	38
6.5.1.2	Point group: 23	40
6.5.2	Hexagonal	40
6.5.2.1	Point group: 6mm	40

6.5.2.2	Point group: $(-6)2m$	41
6.5.2.3	Point group: 6	42
6.5.2.4	Point group: $(-6)$	42
6.5.3	Trigonal	42
6.5.3.1	Point group: $3m$	42
6.5.3.2	Point group: $32$	43
6.5.3.3	Point group: 3	44
6.5.4	Tetragonal	45
6.5.4.1	Point group: $(-4)2m$	45
6.5.4.2	Point group: $4mm$	47
6.5.4.3	Point group: $422$	48
6.5.4.4	Point group: $(-4)$	49
6.5.4.5	Point group: 4	49
6.5.5	Orthorhombic	50
6.5.5.1	Point group: $mm2$	50
6.5.5.2	Point group: $222$	57
6.5.6	Monoclinic	59
6.5.6.1	Point group: 2	59
6.5.6.2	Point group: m	61
6.5.7	Triclinic	62
6.5.7.1	Point group: 1	62
6.6	Third-order nonlinear dielectric susceptibilities	63
6.6.1	Cubic: $m3m$ , $(-4)3m$ ,	63
6.6.2	Hexagonal: 6, $6mm$	65
6.6.3	Trigonal: $32$ , $3m$ , $(-3)m$	65
6.6.4	Tetragonal: $(-4)2m$ , $4/mmm$	66
6.6.5	Monoclinic: 2, $2/m$	66
6.6.6	Orthorhombic: $222$ , $mm2$	67
6.7	Data on crystals (alphabetically ordered substance names)	68
6.8	References for 6	324
6.9	Alphabetical list of crystals	347
6.10	Index of substances for Volumes 29A, 29B and 30A, 30B	355
6.10.1	Alphabetical index of element systems	357
6.10.2	Alphabetical index of names	433