

Index

- 8 – N rule 10, 20, 86, 96
- ab initio* 27, 43, 48, 51, 76, 98, 122
- a-C (amorphous carbon) 17, 25, 36, 37, 38, 51, 56, 60, 65, 72, 89, 98, 100, 101
- a-C:H (hydrogenated amorphous carbon) 16, 17, 72
- a-Ch (amorphous chalcogenide) 3, 140
- ac transport 5
- a-Ge (amorphous germanium) 4, 9, 38, 40, 44, 50, 51, 60
- amorphization 19, 20, 64, 77, 139, 140
- a-Se (amorphous selenium) 1, 40
- a-Si (amorphous silicon) 4, 99
- a-Si:H (hydrogenated amorphous silicon) 2, 135
- avalanche 2, 15
- average coordination 4, 20, 21, 22, 28, 31, 67
- band tail 4, 92, 111
- bond angle 4, 90
- bond breaking 121, 126, 131, 132, 137, 138
- bond energy 31, 32
- bond length 38, 121
- bond strength 43
- Boson peak 30
- Cambridge Structural Database (CSD) 53, 57, 60
- capacitance 102, 103
- carrier generation 140
- carrier–phonon interaction 132
- chain structure 86
- charged defect 103, 104, 132
- charge distribution 24, 96
- chemical vapor deposition (CVD) 14, 18
- conduction band (CB) 91, 93, 103, 104, 105, 106, 107
- constant photocurrent method (CPM) 103
- constraint 4, 60
- continuous random network 50, 94
- cook and quenched 71, 120
- coordination defects 72, 94, 95, 100
- Coulomb interaction 43, 121, 137
- dangling bond 4, 10, 40, 88, 94, 131
- dc conductivity 110
- Debye-type relaxation 126
- deep levels 102
- deep-level transient spectroscopy (DLTS) 102
- defect spectroscopy 101, 133
- density-functional 4, 43, 44, 48, 49, 68, 96
- density of states (DOS) 4, 106
- dielectric relaxation time 110
- digital versatile disk (DVD) 2, 16, 73
- dihedral angle 39
- dispersive transport 5
- distant pair recombination 111
- doping 94, 97, 98, 99
- drift mobility 5
- effective mass 91, 98
- electron nuclear double resonance (ENDOR) 104
- electron–phonon interaction 95
- electron spin resonance (ESR) 88, 94, 95, 103, 104, 131, 132
- electrophotography (xerography) 1, 103
- evaporation 14, 15, 16, 18, 68
- excited electron 121, 124
- extended states 101, 102
- extended x-ray absorption fine structure (EXAFS) spectroscopy 41
- Fermi level 101, 102, 103, 112
- field-effect measurements 102
- field effect transistors 3
- fractal structure 76

146

generation rate 124, 126
giant photoexpansion 5
glass transition 8, 18, 19, 20, 30, 32, 71
glass transition temperature 9, 18, 29, 30, 33, 117, 140
glow discharge 14, 16, 40, 97

heat capacity 9, 27, 28, 29, 33
highest occupied molecular orbital (HOMO) 120, 121, 123
hole creation 121, 123
hopping 5, 48, 99, 103, 108, 110

impurity 6, 93, 96, 97, 98
intimate pair 132
ionic transport 76, 112, 113
irreversible change 117, 126, 139
isothermal annealing 74

Keating potential 42, 43, 45, 50, 60

lattice vibration 27, 28, 91
light-induced electron spin resonance (LESR) 104, 132, 133
linear combination of atomic orbitals (LCAO) 86, 87
liquid crystal display 3
long-range order 4, 7, 90, 91, 94
long-range translational order 8, 33
lone-pair (LP) 4, 90, 93, 106, 138
lowest unoccupied molecular orbital (LUMO) 120, 121

magnetron sputtering 16
mammography 2
medium-range order 8, 37
melting temperature 18, 19, 30, 73
melt-quenching 14
metastable 118, 126, 130, 132
Meyer–Neldel (MN) 5, 76, 112, 113
mobility 3, 5
mobility edge 4, 92

nearest-neighbor 37, 40, 48, 51, 72, 87
negative-U 95, 96, 132
neutron diffraction 35, 37, 38, 39, 40, 53, 56, 60, 68, 100
non-radiative recombination 131, 132
nuclear magnetic resonance (NMR) 24, 41, 104

optical absorption 4, 138
optical memory 16

pair correlation 33, 60
penetration depth 136
percolation path 108
phase-change material 16, 19, 29, 73, 78

Index

phase-change random-access memory (PRAM) 2, 73
photo bleaching (PB) 129
photoconductivity 1, 6, 107, 132
photodarkening (PD) 5, 117, 118, 129, 130, 135, 136, 137, 138, 139
photodegradation 6
photoinduced absorption (PA) 101
photoinduced defect creation (PDC) 128, 139
photoinduced volume contraction (PVC) 118, 136
photoinduced volume expansion (PVE) 117, 118, 128, 135, 136, 137, 138
photoluminescence (PL) 4, 110, 111
photon absorption 110, 121, 124
photothermal deflection spectroscopy (PDS) 101, 102
photovoltaic (PV) 2, 3, 17
plasma-enhanced chemical vapor deposition (PECVD) 14, 16, 17, 18
polarons 5
potential fluctuations 108, 110
primary photoconductivity 107

quadrature frequency-resolved spectroscopy (QFRS) 110, 111
quantum efficiency 133, 134

radial distribution function (RDF) 19, 72
radiative recombination 132
Raman spectrum 122, 123, 140
reactive sputtering 16
refractive index 100, 101, 129
ring statistic 67, 68

second nearest-neighbor 20, 72
self-trapped exciton (STE) 132
short-range order 8, 40
solar cells 3, 140
space-charge-limited current (SCLC) 103
specific heat 29
Staebler–Wronski effect 6, 130
stretched exponential function 126, 128, 136, 138, 139

tail states 4, 92, 106, 110
Tauc relation 106
thin-film transistors (TFTs) 3, 17
time-of-flight (TOF) 5, 107

Urbach tail 106

valence-alternation pairs (VAPs) 95, 96
variable-range hopping (VRH) 5
Verlet algorithm 62, 63, 64, 120
vidicon 2, 15
viscosity 32, 33
Vogel–Tamman–Fulcher equation 33

wrong bond 100	x-ray diffraction 35, 36, 39, 140
xerography 1, 2, 103	x-ray image detector 15
x-ray absorption near-edge structure 77	x-ray image sensor 2
	Zeeman splitting 77