

Index

a

acMAL 341, 345
 active pharmaceutical ingredients (API) 284, 491
 Adam–Gibbs (AG) approach 35, 39, 318
 agarose gels 252
 amorphization 60, 76
 amorphous chiral molecules 138
 amorphous drugs
 – crystallisation below T_g 413
 – stability below T_g 41, 414
 amorphous forms, patentability 500, 501
 – clarity problems in claims 501
 – inventive step 506, 510
 – novelty 504, 510
 – sufficient disclosure 503, 510
 amorphous glucose, thermal and non-thermal routes 376
 amorphous indomethacin 37
 – dielectric susceptibility 42
 – DSC heating scans 43
 amorphous liquid/glassy material structure 12, 14
 amorphous maltitol, dielectric response 47
 amorphous mixtures, physical stability, amorphous drugs 22
 amorphous polymers 230
 amorphous pharmaceutical systems 316
 amorphous phase 205
 amorphous solid, 2 *see also* disordered solid dispersion technologies 22
 amorphous vs. crystalline itraconazole, dissolution rate 61
 Angell's framework 38, 217
 anisotropic molecules, point defects 88
 anti-Stokes shift 363
 antiparallel organization of dipoles 349

API, isomeric structures 183
 apparent solubility 23
 architectures, polymers 202
 aspirin, molecular structure and conformational energy landscape 170
 atomic force microscopy
 – basics 119
 – characterization of defects 121
 atomistic simulations, RDX 99
 atropisomerism 161
 – atropisomers, molecular interconversion 174
 – description 172
 – iodinated contrast media
 – hindered rotation 175
 – iopamidol and iomeprol 175, 177
 – isomeric conformations 175, 176
 atropo-enantiomerism, *see* bis-tetralone
 Avrami plot 330
 Avrami-Avramov plot 331
 Avrami-like function 373

b

β (JG)-relaxation 46, 343
 – acMAL 340, 345
 – CEL stability 343
 – density functional theory 343
 – Gordon-Taylor (GT) equation 339
 – HPMC 339
 – PVP 339
 β of Johari–Goldstein type (β_{JG}) 46, 216
 β -lactoglobulin (β -Lg) gels, storage shear moduli 255
 β -uridinetautomers, dipole moment 193
 Böhmer correlation 320
 BCS class II drug subdivisions 59

- biodegradation, polymers 259
- biopharmaceutical classification system (BCS)
 - 57, 58
- bis-tetralone 155
- bisvinylsulfonemethyl (BVSM) crosslinker
 - 265
- block copolymers 233
- BMS-488043 dose, exposure ratios 62, 63
- Boltzmann distribution 164
- Bose–Einstein factor 364
- Boson peak 399
- Bragg-Brentano geometry 290
- branched polymers 202
- broadband dielectric spectroscopy (BDS)
 - 327
 - advantage 187
 - condensed materials
 - – α -relaxation 190
 - – γ -relaxation character 190
 - – melting–quenching–annealing steps 188
 - – glibenclamide drug 189
 - – organic compound, equilibrium states 188
 - – proton hopping 188
 - – proton transfer reaction 187
 - – ring–chain tautomerism, carbohydrates 189
 - description 301
- bulk defects 493
- Burgers vector 89
- screw dislocation 91

- C**
- caffeine, high temperature hexagonal phase
- crystalline 8
- disordered 9
- caffeine, form II
- polymorphic transformations 381, 382
- structural description 378
- calorimetric glass transition 30
- carbohydrates 170
- carvedilol phosphate hemihydrate 146
- carvone system 144, 145
- CEL stability 343
- celecoxib (CEL) 336, 339
- chain molecules, conformational topology and crystallization 162
- charge-coupled device (CCD) 364
- chemical etching
 - basics 123
 - characterization 123
 - defects, pharmaceutical crystals 124
- chemical shift 429
- chiral molecules 135
- chirality 138
- cinnamic acid crystals
 - structure types 94
 - photochemical reactivity 94
- cis- π -camphanic acid 143
- clarity, claims 492
 - disordered crystals 7, 493
- classical nucleation theory 19, 74
- clopidogrel hydrogeno-sulfate 146
- co-crystals
 - clarity problems in claims 497
 - formation 60
 - inventive step 499
 - novelty 498
 - sufficient disclosure 498
- Cole-Cole (CC) function 308
- Cole-Davidson (CD) approaches 315
- Cole-Davidson (CD) function 309
- conformational conversion, energy landscape 164
- conformational disorder 162
- conformational polymorphism 162, 165
 - computational approach 166
 - crystal structure prediction 166
 - definition 165
 - flexibility and crystallization 167
 - flexible molecule, solution crystallization 167
 - physical organic approach 166
 - prediction studies 169
- contact time 432
- conventional film casting 482
- cooperatively rearranging region (CRR) 318
- copolymers 202, 232
 - organised amorphous structure 212
- coupling model (CM) 323
- Crankshaft-type rotations 216
- cross polarization (CP) 432
- crosslinked polymers 250
- cryogel method, polyester scaffold preparation 271
- cryomilling 469
- crystal defects, *see also* crystal imperfections
 - complementarity of techniques 126
 - densities within crystals 125
 - nature and abundance 103
 - surfaces 119
 - techniques 104
 - TEM, *see* transmission electron microscopy
 - types 103
 - within crystals, characterization techniques 104

- crystal engineering 346
 crystal formation mechanism, solution
 aggregates 179
 crystal imperfections 7, 494
 – first kind
 – – description 7
 – – ice disorder 9, 10
 – – one-dimensional monoatomic model 8
 – – rotationally disordered crystals 8
 – – substitutional disorder 10
 – – thermal agitation 7
 – line imperfections 89
 – pharmaceutical systems 99
 – planar imperfections 91, 92
 – point defects 87
 – second kind 11, 12
 crystal lattice, symmetry operator restrictions 136
 crystal size effect 5
 crystalline lamella 207
 crystalline solids 2
 – description 2
 – elastic behaviour 2
 crystalline solution 11
 crystalline structures, polymers 206
 crystalline-crystalline polymorphic transformation 470
 crystallinity quantification 410
 crystallisation 16
 – amorphous drug above T_g 410
 – amorphous drug below T_g 413
 – glassy state 335
 – ground powder 371
 – and structural relaxation 333
 – thermodynamic driving force 16
 curves 18, 19
 9-cyanoanthracene
 – photodimerisation 96
 – solid-state photochemical reactions 95
 – stacking faults 95
 L-cysteine 122
- d**
 Debye relaxation 303, 405
 Debye theory 399
 Debye–Scherrer geometry 290
 Debye–Waller factor 8
 degradable hydrogels 259
 density functional theory (DFT) calculations 343
 desolvation process, paracetamol 96
 developability classification system (DCS) 59
- dextran hydroxyethyl methacrylate (dex-HEMA) hydrogel 259
 diacetylenes 95
 1,8-dichloro-10-methylanthracene crystals 97
 dielectric permittivity 302
 dielectric relaxation principles and models, Debye relaxation 303
 dielectric response
 – disordered materials 397
 – and molecular mobility, partially ordered pharmaceutical systems
 – – antiparallel organization of dipoles 349
 – – crystal engineering 346
 – – liquid-crystalline phases 350
 – – plastic crystal 347
 – – rotator phase 347
 dielectric spectra, relaxation processes identification 312
 dielectric spectroscopy 218
 – essence 301
 dielectric susceptibility, amorphous indomethacin 42
 different spectroscopic techniques 362
 differential scanning calorimetry (DSC) 362, 502
 dipolar coupling 429
 diprophylline 143, 144
 direct classical least squares (DCLS) 370
 dislocation, 89 *see also* line imperfections
 – dynamics simulations 99
 – line 90
 disordered biological and pharmaceutical systems
 – crystallinity quantification, 410
 – crystallisation
 – – amorphous drug above 410
 – – amorphous drug below 413
 – – amorphous drug below stability 414
 – – multi component disordered pharmaceutical systems 416
 disordered crystals 7, 493
 – clarity, claims 493
 – inventive step 496
 – novelty 495
 – patentability 493
 – sufficient disclosure 494
 – terahertz studies 400
 disordered solids, pharmaceutical formulations 1
 dissolution rate 58
 2,5-distyrylpyrazine 95
 divinyl monomers 95
 drug concentration time profile 63

- drug crystallization 73
- drug supersaturation, *see also* drug-polymer interactions
 - cellulose derived polymers 68
 - drug–polymer hydrophobic interactions 69
 - formulation variables 74
 - hydroxypropylmethylcellulose acetate succinate 68
 - polymer concentration 71
 - polymer structure 68
- drug–polymer interactions
 - Flory–Huggins theory 71
 - ionic interactions 71
 - indomethacin solution 72
 - solid dispersions 70
- dry powder coating 474
- dynamic disorder 430
- dynamic glass transition 217

- e**
- edge dislocations 89, 91
 - RDX and PETN 99
- Einstein-Stoke-Debye relation 405
- elastic properties, cryogel films 270
- electrospinning and spin coating 483
- electrospraying 275, 483
- electrostatic potentials
 - glibenclamide 186
 - HDp44mT compound 186
- enantiomeric excess 136
- enantiomers
 - conglomerates 154
 - degrees of disorder among crystallized enantiomers 140, 141
 - diprophylline 143, 144
 - disorders not affecting stereogenic centers 140
 - fast racemizable 137
 - features 135
 - limonene 138
 - multi-epitaxy 154
 - non racemizable 137, 141
 - solvent role 145
 - static/dynamic disorder 139
- energy landscape topology 49
 - fragility 49, 50
 - polyamorphism 50
- entropic elasticity, polymer networks 250
- epitaxy 136
- equal area rule 44
- erythromycin 186
- etching surface, *see* surface etching
- 5-ethyl-5methylhydantoin antipodes 136

- Eudragit E PO 231
- excipient gain factor 76
- experiment 205
- extended Adam-Gibbs model 339

- f**
- far-infrared spectroscopy 395
- fast racemizable enantiomers 137
- fast secondary relaxation and caged dynamics 398
- felodipine solid dispersions 74
- fiber based scaffolds, electrospinning 275
- fictive temperature of glasses 43
- film coating 482
- Flack parameter 155
- Flory-Stockmayer gel point 261
- Flory-Stockmayer theory 261
- Flory–Huggins parameter 223
- Flory–Huggins theory 71
- Fourier transform calculation 288
- Fourier transform Raman spectra (FT-Raman) 364
 - measurements 502
- fragility 320
 - concept 319
 - pharmaceutical glass formers 32, 34, 37, 321
- free enthalpy 15
- free induction decay (FID) 429
- freeze drying 481
- D-fructose
 - γ -process 190
 - mutarotation process 195
 - structure relaxation times 189

- g**
- gelatin gels 252, 254, 264
- gelatin hydrogel structure 266
- gelatin hydrogels 265
- gels 242
 - chemical gels 245
 - definition 244
 - formation 139
 - gelatin gels 254, 264
 - gelatin hydrogels 265
 - globular protein gels 254
 - hybrid gels 248
 - hydrogels, *see* hydrogels
 - physical gels 245
 - point 264
 - poloxamer gels 266
 - sol-gel transition 261
- Gibbs Duhem equation 65
- Gibbs–Scott phase rule 137

glass–rubber transition behaviour 213
 glass formers, disorder
 – aging and variability 41
 – dynamics and thermodynamics 39
 – fictive temperature 43
 – glass transition 32
 – Kauzmann paradox 33
 – non-Arrhenius temperature dependence 36
 – non exponential relaxations and dynamic heterogeneity 40
 – nonlinearity 44
 – secondary relaxations 46
 – three noms of glass formers 35
 glass materials, amorphous forms 2, 508
 glass transition of blends 221
 glass transition temperature 205
 – definition 3
 glass-melting 24
 glassy state, crystallization 16, 335
 glibenclamide
 – electrostatic potentials 186
 – relaxation times and static permittivity 191
 – selected kinetic curves 194
 glibenclamide drug
 – dielectric loss spectra 191
 – incubation time 194
 – structure relaxation times 189
 globular protein gels 254
 Gordon–Taylor (GT) equation 339
 Gordon–Taylor law 138
 grain boundaries 91
 graphite, stacking faults 92

h

Havriliak and Negami (HN function) 309
 Havriliak–Negami (HN) approach 315
 HDp44mT compound, electrostatic potentials 186
 heterogeneous scenario 323
 hexahelicene, molecular conformation 173
 high frequency spectrum, raman spectra 369
 high power decoupling (HPD) 431
 high resolution electron microscopy (HREM) 105
 homogeneous scenario 323
 hot melt extrusion (HME) and injection molding 474
 HPMC 231
 hybrid gels 248
 hydrochlorothiazide (HCT) 296

hydrogels
 – containing sliding crosslinks 248
 – description 241
 – double-network hydrogels 247
 – interpenetrating polymer networks 247
 – thermoreversible hydrogels 246
 hydrogen-bonded liquids and solutions 404
 hydrophobic substituents, polymers 68
 hydroxypropyl methylcellulose (HPMC) 339
 hydroxypropylmethylcellulose acetate succinate (HPMCAS) 68

i

ibuprofen 374
 immiscible polymer blend formulation 70
 imperfect crystals 7, *see also* also-crystalline imperfections
 impurity molecules 88
 indomethacin (IMC) 371, 470
 – amorphous 29, 37, 42
 – amorphous state 383
 – dissolution behavior 64
 – experimental kinetic solubility profile 74
 – and poly(vinyl pyrrolidone) blend 222
 – solid dispersions 71, 72
 – solubility profiles 23
 injection molding 477
 inorganic glasses 403
 interatomic distance 286
 intercrystalline links 207
 interfacial free enthalpy 20, 21
 internal interactions 429
 interpenetrating polymer networks (IPNs) 247
in vitro dissolution tests 75
 iodinated contrast media (ICM)
 – atropisomerism
 – hindered rotation 175
 – – iopamidol and iomeprol 175, 177
 – – isomeric conformations 175, 176
 iopamidol and iomeprol 175, 177
 iopanoic acid polymorphs, dissolution rate 60
 irradiation process 87
 Isobaric fragility 318
 isotactic polypropylene, ternary helical conformations 163
 isothermal crystallization 329
 itraconazole solid dispersions 71, 72, 75

j

Johari-Goldstein (JG) relaxation 314, 323

k

- Kauzmann paradox 33
 Kauzmann temperature 325
 KinetiSol dispersing 477, 478
 Kohlrausch-Williams-Watts (KWW) function 308, 311

l

- landscape, *see* energy landscape
 Laser scattering tomography 125
 Lattice vacancy 85
 Lauritzen-Hoffman theory 209
 leaching techniques, scaffolds 275
 limonene 138
 line defects 493
 line imperfections
 – Burgers vector 89
 – description 89
 – explosive organic systems 99
 linear polymers 202
 – conformations of chains 203
 – semi-crystalline polymers 225
 – stereoregularity and configurations 202
 liquid and glassy states
 – physical stability, drugs 16
 – – BDS, supercooled liquid 327
 – – vs. cold crystallization 327
 – – prediction 324
 liquid form 2
 liquid-crystalline phases 350
 lovirdie supersaturation 76
 low-frequency spectrum (LFRS) 366
 lyophilisation, *see* freeze drying

m

- macrolideantibiotic 186
 magic angle spinning (MAS) 431
 maltitol 47, 48
 maribavir 154
 masterplot 339
 matrix controlled polymerisation 94
 melt-electrospinning 477, 478
 melt granulation 472
 melt-quenching 471
 membrane permeability 57
 mesh size physical gels 258
 meta-toluidine, XRD patterns 14
 micro-Raman spectroscopy 382
 microcalorimetry 267
 microfibrils 208
 milling 468
 mixing free energy of blends 223
 mobilities, polymers 215

- mobility islands 323
 molecular crystals
 periodic property 4
 – X-ray powder diagrams 6
 molecular mobility
 – and dielectric response, partially ordered pharmaceutical systems
 – – antiparallel organization of dipoles 349
 – – crystal engineering 346
 – – liquid-crystalline phases 350
 – – plastic crystal 347
 – – rotator phase 347
 – glassy state 322
 – supercooled liquids 317
 monomer structures 232
 multi component disordered pharmaceutical systems 416
 multiamorphicity 50
 multivariate analysis (MVA) 370, 382
 mutarotation, *see* ring-chain tautomerism

n

- nanocomposite hydrogels 249
 nanocrystals, patentability clarity problems 509
 nanocrystalline itraconazole formulation 62
 nematic mesophase formation 352
 networks, polymers 202
 NH-tautomerism 185
 nifedipine, defects 127
 non crystalline solids 2
 non racemizable enantiomers 137, 141
 non-Arrhenius temperature dependence, viscosity and relaxation times 36
 non-Debye relaxation models 307
 non-equilibrium point defects 87
 non-isothermal crystallization 328
 normal mode, molecular origin 314
 nucleation 17

o

- octaacetylmaltose (acMAL) 339
 optical microscopy 118
 on-line Raman spectroscopy 383
 oral drug absorption barriers 57
 organic crystals, point defects 88
 organic glass-forming liquids 404
 – hydrogen-bonded liquids and solutions 404
 – supercooled liquids and glasses 407
 organic-inorganic IPN 249
 orthoterphenyl (OTP) 367

p

- pair distribution function (PDF) 13, 502
 - applications 292
 - – hydrochlorothiazide 296
 - – rac-modafinil, polymorphs of 294
 - description 284
 - interatomic distance 286
 - measurement 288
 - modelling 290
 - $G(r)$ yields 285
- paracetamol crystals, dislocation dynamics simulations 99
- patent applicants 492
- patent practitioners 491
- patentability
 - amorphous forms 500, 501
 - – clarity problems in claims 501
 - – inventive step 506, 510
 - – novelty 504, 510
 - – sufficient disclosure 503, 510
 - co-crystals 496
 - – clarity problems in claims 497
 - – inventive step 499
 - – novelty 498
 - – sufficient disclosure 498
 - disordered crystals, *see* disordered crystals, patentability
 - nanocrystals 509
 - – clarity problems 509
- Pauling ice rules 10
- PDF, *see* pair distribution function (PDF)
- percolation model 262
- perfect crystals
 - description 2, 3
 - periodic property 3
 - translational invariance 3
 - X-ray diffraction experiment 3, 4
- pharmaceutical compositions, amorphous forms 508
- pharmaceutical polymers
 - architectures, polymers 202
 - crystalline structures, polymers 206
 - description 201
 - dynamic disorders 213
 - – glass–rubber transition behaviour 213
 - mobilities, polymers 215
 - physical behaviour 224
 - – amorphous polymers 230
 - polymer and small molecules blends 221
 - – glass transition of blends 221
 - – mixing free energy of blends 223
 - – solubility limit, small molecules in polymers 223
- structural states and phases transitions 205
 - – amorphous phase 205
 - – synthetic and natural 225, 226
- pharmaceutical processing
 - film coating 482
 - freeze drying 481
 - milling 468
 - solvent evaporation-based processing techniques, spray drying 478
- pharmaceutical solid formulations
 - development 361
- phase separation 26, 246
- phase transformations, polymer solutions 269
- phase-change materials (PCMs) 402
- physical ageing 205
- physical gelation 243
- physical gels
 - conformational changes of polymer chains 245
 - denaturation of globular proteins 245
 - elasticity 251
 - hydrophobic effect 246
 - phase separation 246
 - swelling 258
 - synergy 246
- piroxicam 471
 - enhanced dissolution 70
- planar imperfections 91
- plastic crystal, 347 *see also* rotationally disordered crystals
- plastic deformation 87
- PLGA-nanohydroxyapatite composite scaffolds 273
- pluronics_® 267
- point defects 87, 493
 - explosive organic systems 99
- Poley absorption 394
- poloxamer gels 233, 266
- poly(dimethylsiloxane), end-linking reaction 263
- poly(L-lactic acid) (PPLA) 218
- poly(*N*-isopropylacrylamide) (poly-NIPAM) 246
- polyamorphic situations analysis 370
- polyamorphism 50
- polyelectrolyte gel 256, 257
- polyester scaffold preparation, cryogel method 271
- polyethylene chain, parameters and topological changes 162
- polymer 402
 - hydrophobicity 69
- polymer, molecular properties 68, 69

- polymer networks
 - biodegradation and swelling 259
 - elasticity, physical gels 251
 - entropic elasticity 250
 - network swelling 256
- polymeric gels 244
- polyols study 409
- polypeptides 202
- polysaccharides 202
- polytypism 92
- polyvinylpyrrolidone (PVP) 339
- pore size distribution 269
- porogens 275
- porous matrice preparation 275
- potential energy hypersurface 33
- precipitation inhibition, drugs 69
- preferential enrichment
 - crystalline nature of compounds 150
 - discovery 149
 - mechanism 152
 - principle and feature 150
 - racemic compound crystals 152
 - requirements 152
- primary (α -) and secondary (β -) relaxations 37, 47, 397, 398
- principal component analysis (PCA) 370
- problem–solution approach 492
- processes, amorphous forms 508
- proton transfer reaction 183
- pseudoracemic crystalline phase 10
- PVA hydrogels 270
- PVP 231
- PVP/VA64 233
- PVPVA 234

- q**
- Qmax value 289

- r**
- Rac-modafinil, polymorphs of 294
- racemic composition 136
- racemic compound 136
- racemization process 136
- radius of gyration (R_g) 204
- Raman and neutron scattering 396
- Raman mapping 386
- Raman microspectroscopy 386
- Raman shift 363
- Raman spectroscopy
 - basic theory 362
 - categories 361
 - description 362
 - equipment and procedures 364
 - on-line 383
- molecular compounds analysis 365
- Rayleigh scattering 363
- regular conformations of chains 204
- relaxation processes identification, dielectric spectra
 - basics 312
 - relaxation α 314
 - secondary relaxations and excess wing 314
 - structural relaxation α 312
- reverse Monte Carlo type 290
- D-ribose
 - dielectric loss spectra 191
 - relaxation times and static permittivity 191, 193
 - selected kinetic curves 194
- Rietveld refinement 292
- ring molecules, conformational flexibility, *see* carbohydrates
- ring-chain tautomerism 183, 185
- rotational isomeric state model 166
- rotationally disordered crystals 8
- rotator phase 347
- rubber like elasticity 250

- s**
- S and R hydrogenosulfate, clopidogrel 148
- scaffolds
 - description 241
 - design 241
 - drug releasing requirements 269
 - fabrication 268
 - leaching techniques 275
 - manufacturing techniques 275
 - spinodal decomposition, *see* spinodal decomposition
 - supercritical processing 274
 - tissue engineering 268
- Scherrer equation 6
- Schoencke space groups 137
- screw dislocation 89, 91, 96
- second-order nonlinear optical imaging of chiral crystals (SONICC) 230
- secondary relaxation processes 322
- secondary relaxations and excess wing 314
- semi-crystalline polymer 215, 225
 - microstructure 225
- semisolid dosages 242
- shielding interaction 429
- Shish-kebab organisation 208
- Shish-kebab structure 209
- sildenafil 328
- simvastatin 402
- slip 90
- sol-gel transition 243, 261

- solid crystalline imperfections, *see* crystal imperfections
- solid dispersions 66, 67, 73
 - dissolution behavior 67, 68
 - supersaturation measurement 75
- solid form 2
- solid semi-crystalline polymer 165
- solid state analysis 362
- solid state NMR spectroscopy (SSNMR) 427, 502
 - advantages 427
 - basics 428
 - cross polarization 432
 - experimental approach 430
 - internal interactions 430
 - isotropic chemical shift 431
 - uses 427
- solid-state polymerisation 94
- solubility
 - amorphous compounds 64
 - amorphous vs. crystalline celecoxib 61
 - definition 58
 - description 23
 - enhancement ratio 66
 - enhancing approaches
 - cocrystals 60
 - metastable polymorphs 60
 - milling 60
 - particle size reduction 59
 - salts 60
 - indomethacin 23
 - limit 24
 - miscibility gap in liquid state 25
 - supersaturation measurement 75
 - van't Hoff type plots 61
- solubility limit, small molecules in polymers 223
- soluplus 234
- solvent evaporation-based processing techniques
 - film coating 482
 - freeze drying 481
 - spray drying 478
- solvent volatility 275
- sorbitol 48
- spherulites 207, 208
- spinodal decomposition
 - organic-inorganic composite scaffolds 273
 - ternary system 271
- spontaneous enantioresolution phenomenon,
 - see* preferential enrichment
- spray chilling/congealing 472
- spray drying 480
- spring and parachute effect 67
- stacking faults 92
- stereoregularity and configurations, linear polymers 202
- Stokes-Einstein equations 333
- stress induced phase transformation 99
- structural relaxation α 312
- structural relaxation, crystallization and 333
- substitutional disorder 10
- succinonitrile 400
- sucrose crystals, dislocation dynamics simulations 99
- supercooled liquids and glasses 397, 407
 - fast secondary relaxation and caged dynamics, 398
- primary (α -) and secondary (β -) relaxations, 397
- vibrational density of states, 399
- supercooled pharmaceuticals, tautomerization kinetics 190
- supercritical fluids (SCFs) 274
- supersaturation measurement 75
- surface etching 123
- swelling, polymer gel 256
- symmetry operation, restrictions 136
- t**
- tablet, oral administration 57, 58
- tautomeric pairs 184
- tautomerization
 - broadband dielectric spectroscopy
 - advantage 187
 - condensed materials 187
 - description 183
 - drug industry 183
 - erythromycin 187
 - supercooled pharmaceuticals 190
- tautomers, frequency distribution 184
- tazofelone 144, 145
- telmisartan 327
- terahertz frequencies, supercooled liquids and glasses
- fast secondary relaxation and caged dynamics 398
- primary (α -) and secondary (β -) relaxations 398
- vibrational density of states 399
- terahertz spectroscopy
 - crystallinity detection 410
 - description 393
 - exploration prior to THz-TDS
 - far-infrared spectroscopy 395
 - Poley absorption, 394
 - Raman and neutron scattering 396
 - naproxen study 413

- terahertz spectroscopy (*contd.*)
 - supercooled liquids and glasses 397
 - primary (α -) and secondary (β -) relaxations 37, 46, 397
 - time-domain 394
 - terahertz studies, disordered molecular solid
 - disordered crystals 400, 402
 - inorganic glasses 403
 - polymers 402
 - theophylline, TEM images 105
 - thermal processing techniques
 - dry powder coating 474
 - hot melt extrusion (HME) and injection molding 474
 - melt granulation 472
 - melt-fusion method 471
 - principles 470
 - spray chilling/congealing 472
 - thermal sintering/curing 473
 - thermal sintering/curing 473
 - thermally induced phase separation (TIPS)
 - with solvent crystallization, 270
 - thermodynamic approach, amorphous compounds, apparent solubility 22, 64
 - thermodynamics 320
 - parameter 321
 - thermogravimetric analysis (TGA) 502
 - thermoreversible hydrogels 246
 - three nons of glass formers 35
 - time, temperature, transformation rate (T,T,T)
 - diagram 16, 17
 - translational invariance 3
 - transmission electron microscopy
 - characterization of defects 110
 - applications, pharmaceutical samples analysis 107
 - basics 105
 - study of defects 112
 - triblock copolymer 233
 - triphenyl phosphite (TPP) 367
 - glacial phase 50
 - twin planes 91
 - twinning 92
 - twins 136
 - two-order-parameter (TOP) model 319
- u**
- uric acid crystals 122
- v**
- van't Hoff type plots 61
 - vibrational density of states (VDOS) 367, 399
 - vitrification by supercooling 28
 - vitrification 319, 407, 409
 - by supercooling 28
 - Vogel–Fulcher–Tamman (VFT) equation 36, 217
- w**
- Williams, Landel, and Ferry (WLF) equation 38
 - Winter-Chambon criteria, gelation 264
- x**
- X-ray diffraction topography
 - applications 117
 - basics 115
 - characterization 116
 - defects within crystals 118
 - X-ray powder diffraction 362
- z**
- Zeeman interaction 429