

Index

A

- Acoustic emission (AE)
 - application, 304
 - particle-particle and particle-wall collisions, 303
 - PAT tool, 304
 - ultrasound frequency range, 304
- Active pharmaceutical ingredient (API)
 - coated MPs, 163
 - FDCs, 156–158
 - HME, 225, 248
 - inert core, defined, 6
 - modified release products, 66
 - multiparticulate system, 3
 - nanocrystals, 160
 - physical and chemical properties, 149
 - solvent evaporation process, 126
 - water-soluble drugs, 130
- Age-appropriate drug formulations, 97
- Aqueous coating systems
 - bottom-spray Wurster system, 286, 287
 - chlorpheniramine maleate release profiles, 286, 287
 - environmental concerns and operator safety, 286
 - extended release oral solid dosage forms, 286
 - surelease, 286
- Aqueous ethyl cellulose ER system, 114
- Artequin™ Paediatric, 232
- Attention deficit hyperactivity disorder (ADHD), 172, 200, 232

B

- Banded capsule, 347–348
- Barrier membrane coatings
 - aqueous and solvent coating, 285
 - mechanisms, 272
 - tablet dosage forms, 268
- Beads
 - anti-tacking agents, 250
 - EC systems, 285
 - floating and non-floating, 374
 - gamma scintigraphy, 375, 376
 - gross examination, 375
 - inert cores, 6
 - and nonpareil seeds, 244
 - oral multiparticulate systems, 1
 - particle size distribution, 22
 - production technology advancement, 223
- Bioavailability-enhancing drug
 - forms, 160–161
- Bio-predictive dissolution testing, 189–190
- Biorelevant dissolution system, 188, 190, 193, 195, 204
- Biorelevant pH gradient method, 198, 203–205
- Black box device, 196
- Bottom spray process, 68–71, 244, 245
- Brunauer-Emmett-Teller (BET) mathematical model, 30

C

- Capsule filling
 - coating, 348

- Capsule filling (*cont.*)
 direct weight checking systems, 354
 indirect dosage control systems, 351–353
 principles, 335–336
 and product combinations, 346
 quality control
 CPP, 349
 CQA, 349
 in-line controls, 349
 weight and content uniformity tests, 349
 weight control approaches, 350
 solid forms, 345–347
- Capsules. *See* Dosing principles; Capsule shells; Capsule filling
- Capsule shells
 automatic unclogging, 336
 bulk density, 25
 damage/deformation, 353
 layer-by-layer adsorption, 125
 types, 336–337
- Captopril release profile, 136
- CAT. *See* Colon arrival time (CAT)
- Centrifugal extrusion, 127
- Chord length distribution (CLD), 307, 308
- Coating process
 aqueous EC dispersions, 285
 continuous water-filled channels, 285
 curing process, 285–286
 equipment, 284
 fluid bed drying, 285
 formulation factors, 285
 processing parameters, 284–285
 solubility and diffusivity, 286
- Coating zone, 66, 68, 72, 77, 78, 88
- Colon, 364–365, 382
- Colon arrival time (CAT), 369, 370
- Colon delivery and gastrointestinal targeting, 253–254
- Colonic transit time (CTT), 187
- Combined multi-particulate products, 172
- Continuous drug pelleting system (CDP), 52
- Cosmetic coatings, 254
- Critical process parameters (CPP), 84, 86, 88, 89, 302, 349, 350
- Critical quality attributes (CQA), 6, 85, 302, 315, 349, 350
- Crospovidone, 44
- D**
- Degree of substitution (DS), 269, 270
- Delayed release (DR), 66, 97, 109, 170, 171, 254, 288, 346
- Delayed release mini-tabs, 97, 109
- Design of experiments (DoE), 85, 88
- Differential scanning calorimetry (DSC), 240
- Dimethyl sulfoxide (DMSO), 42, 43
- Direct weight checking system, 354, 355
- Discrete element modeling (DEM), 58
- Diskjet, distribution plate, 72, 73
- Dissolution methods
 database, 174
 ER pellet formulation, 204
 multiparticulates
 ER, 202, 204–206
 DR, 197, 198, 200, 202
 taste-masked, 195–197
 non-official dissolution methods, 176
 official dissolution methods, 174–177
 QC methods, 177
- Dissolution test media
 blank media, 195
 colonic fluids, 194
 fasting and fed conditions, 193–194
 gastric fluids, 193
 saliva fluids, 190–195
 small intestinal fluids, 194
- Dosage checking systems, 351, 352
- Dosators system, 340
- Dose-weight proportional formulation, 3
- Dosing principles
 filling pellet multiparticulates, 339, 341, 342
 filling phase, 345
 mini-tabs, 342, 344
 powder dosing, 337–338
 soft gel, 345
- Dosing wheel approach, 102
- DR. *See* Delayed release (DR)
- Drug layering/film coating
 droplet size, 79, 81
 heat and mass transfer, 76–78
 liquid properties, 82–84
 substrate flow, 78
- Drug loading control, 159
- Drug release mechanism
 channels/pores, 272
 EC barrier membrane films, 272
 flaws, cracks and imperfections, 272
 osmotic pressure, influence of, 273 (*see also* EC-coated multiparticulates)
- Dry powder layering technology, 291
- DS. *See* Degree of substitution (DS)
- E**
- EC. *See* Ethylcellulose (EC)
- EC-coated multiparticulates
 drug characteristics, 282–283
 higher-molecular-weight grades, 274

- plasticizers (*see* Plasticizers)
 - polymer concentrations, 274
 - pore formers, 280–282
 - rate of water ingress, 273
 - solvent system, 274–275
 - substrates, 283
 - viscosity grade, effect of, 273
 - Effervescent floating multiparticulate system
 - acidic and alkaline materials, 377
 - ofloxacin, 377
 - pellets preparation, 378–379
 - in vivo* characterization, 379–381
 - Emulsification and solvent evaporation
 - approach, 133, 142
 - Encapsulation
 - CPT, 129
 - hydrophilic drugs, 130
 - IFP, 128
 - polymer encapsulation, 128, 129
 - in situ* polymerization, 128
 - Encapsulation efficiencies (EE), 136, 142, 149
 - ER pellet formulation, 204
 - Esophagus
 - active and passive mechanisms, 361
 - adhesion of formulations, 361
 - advantages, 361
 - bisphosphonates, 361
 - during swallowing, 361
 - Ethylcellulose (EC)
 - aqueous coating systems, 286–288
 - aqueous dispersion, 271
 - chemical structure and, 269
 - dry powder layering process, 291
 - DS, 269
 - film formation (*see* Film formation)
 - fluid bed process, 289, 290
 - nutritional application, 288
 - Opadry[®] EC coating system, 283
 - pharmaceutical formulations, 268
 - QbD, 290–294
 - range of viscosity grades, 269 (*see also*
 - Coating process; Drug release mechanism)
 - Surelease[®], 269
 - taste masking, bitter drugs, 288
 - versatile properties, 268
 - viscosities, 270
 - water-insoluble cellulose, 269
 - water-insoluble polymer, 268
 - EUDRACOL[®], 260
 - EUDRAGIT RS, 109, 132, 138, 205, 206, 260
 - EUDRAGIT[®] polymers, 249
 - EUDRAGIT[®] RS films, 262
 - European Paediatric Formulation Initiative (EuPFI), 225
 - Extended release (ER)
 - capsules, 346
 - EUDRACOL[®], 260
 - EUDRAGIT RL and EUDRAGIT RS, 258, 260
 - formulations, 170
 - polymeric films, 258
 - Extrusion
 - feeding systems, 48
 - PAT, 49, 50
 - pellets, 38
 - process parameters
 - process control, 49
 - thermal energy, 48
 - small-scale, 47, 48
 - types
 - melt extrusion, 38
 - melt solid lipid extrusion, 39
 - wet extrusion, 38
 - wet pellets, 38
 - Extrusion-spheronization
 - advantages, 39
 - disadvantages, 40
 - DMSO, 42
 - MCC, 41
 - pelletization aid, 41
 - pellets, 42
 - requirements, 40
 - water, 42
 - wet mass, 41
- F**
- Fasted-state simulated colonic fluid (FaSSCoF), 195
 - Fasted-state simulated gastric fluid (FaSSGF), 193
 - FB. *See* Fluidized bed (FB) process
 - FBRM[®]. *See* Focused beam reflectance measurement (FBRM[®])
 - Fed pH-gradients, 201
 - Fed-state simulated colonic fluid (FeSSCoF), 195
 - Film formation, 242
 - aqueous dispersion, 272
 - solvent solution, 271
 - Fixed-dose combination (FDC)
 - advantages, 2, 157
 - coating, MPs, 161, 162
 - combination therapy, 97
 - diabetes treatment, 163

Fixed-dose combination (FDC) (*cont.*)
 disadvantages, 157, 158
 dosage forms, 162
 dual-release tablet, 162
 Logimax, 161, 164
 MP cores
 bioavailability-enhancing drug forms, 160
 drug loading control, 159–160
 processes and physical properties, 159–161
 release profile control, 160
 TB therapy, 163

Fluid bed coating
 applications, 66
 bottom spray processing, 68, 70, 71
 coating materials, 66
 coating zone, 66
 Hüttlin fluid bed, 71, 72
 intrinsic properties, 66
 rotor/centrifugal processing, 73, 75
 top spray (*see* Top spray process)

Fluidized bed (FB) process
 agglomeration, 289
 batch to batch variability, 290
 device characteristics, 315
 in-line particle measurement factors, 313, 314
 process characteristics, 314
 product characteristics, 313, 314
 scale-up considerations
 CPP, 84, 86, 88, 89
 CQA, 85, 87, 89
 dissolution testing, 86
 DoE, 87
 filters, 87
 fluidization, 91
 mass flow, 89, 90, 92
 peak spray rate, 85
 Pilot-scale Wursters, 88
 scaling factors, 88
 tracings, 90
 small-scale and research and development batches, 289
 spray drying, 289
 static charge, 289
 technology, 127

Focused beam reflectance measurement (FBRM[®]), 307

Friability
 mini-tabs coating, 102
 of pellets, 31–33
 properties, 44
 substrate hardness and, 345

G

Gamma scintigraphy
 gamma emitters, 366
 orally administered dosage forms, 366
 pharmaceutical, 369, 370
 radioactive materials, 367
 radiolabeling techniques, 367–369

Gas anti-solvent (GAS), 129

Gastric emptying time (GET), 182, 183

Gastrointestinal (GI) tract, 170
 anatomy, 178–179
 emptying, 182, 183
 function, morphology and physiology, 360, 361
 GI motility patterns, 182
 immediate-release formulations, 181
 large intestinal (colonic) motility and passage times, 186, 187
 large intestinal (colonic) physiology, 186 and microenvironmental conditions, 360
 monolithic enteric-coated dosage forms, 183, 184
 oral dosage forms, 181
 physiology, 180, 184, 185
 small intestinal motility and passage times, 185, 186

Gastro-resistant formulations
 anti-tacking agents, 250
 EUDRAGIT FS 30 D, 251
 EUDRAGIT L 100-55, 249
 EUDRAGIT L 30 D-55, 249, 252, 253

Gastro retentive multiparticulate system
 buoyancy, 374
 clinical protocol, 375–377
 floating and non-floating beads, 374
 formulator, 374
 gastric emptying, 374
 manufacturing and radiolabeling, 374–375

Generally regarded as safe (GRAS), 230, 268, 288

GI. *See* Gastrointestinal (GI) tract

Glatt CPS rotor processor, 74, 75

GraphPad Prism Software, 136

Gravimetric pellet dosing, 340

H

Hard shell capsules
 dosing (*see* Dosing principles)
 filling principles, 335–336
 shell types, 336
 solid forms, 345

Hot melt extrusion (HME) process, 225, 247–249

Hot melt microencapsulation, 124, 125
Humidity control systems, 83
Hüttlin bottom spray processor, 72
Hüttlin fluid bed, 71, 72
Hydroxypropyl methylcellulose acetate succinate (HPMCAS), 260

I

IBD. *See* Intestinal bowel diseases (IBD)
IFP. *See* Interfacial polymerization (IFP)
Immediate drug release (IR), 173
 coating systems, 101
 formulations, 170
Indirect dosage control systems
 LDVT, 352
 pellet dosing, 352
 powder dosing, 352
 sensors, 351
 X-ray-based system, 353
Inert core
 brand/generic spheres, 7
 CQA, 6
 defined, 6
 densities, 24
 microcrystalline cellulose spheres, 7
 pellets (*see* Pellets)
 sugar spheres, 7
In-line NIR, 304
In-line particle size characterization
 AE, 303–304
 at-line, in-line and online, 303
 defined, 302, 303
 FB process, 313–315
 FBRM[®], 307–308
 image analysis, 304–306
 IPP 70 probe system, 312
 laser diffraction, 306
 median granule particle size, 316
 methods, 302, 316
 multiparticulate production process, 303
 NIR, 304
 off-line and in-line, 313–317 (*see also*
 Pellet coating process;
 Process interface)
 SFT, 308–312
 size distribution, granules, 302
IntelliCap System, 372
Interfacial polymerization (IFP), 128
Intestinal bowel diseases (IBD), 171
In situ polymerization, 128
In vitro drug release
 aerobin, 203

Eudragit RS-coated diclofenac sodium pellets, 206
mesalazine formulations, 199
Ritalin LA, 201
Theophyllin AL, 203
IPP 70 probe system, 312

K

Kopcha model, 145

L

Large intestinal (colonic) physiology, 186
Laser diffraction, 16, 306, 307, 313, 314, 316, 317, 329
Linear variable displacement transducer (LDVT), 352
Liquid manufacturing vehicle (LMV), 125
Logimax, 161, 164

M

Magnetic marker monitoring (MMM)
 bar magnets/electromagnets, 370
 electrical currents and elevators, 370
 iron oxide magnetite (Fe₃O₄), 370
 SQUIDs, 370
 tracking of magnetic material, 370
 in vivo behavior, multiparticulates, 370
Magnetic resonance imaging (MRI), 371
Makoid–Banakar model, 145
MCC. *See* Microcrystalline cellulose (MCC)
MDR. *See* Multidrug resistant (MDR)
 bacterial strains
Mechanical Mini Tablet System (mMTS), 104
Melt extrusion, 38
Melt-spray-congealing (MSC) process, 159
Mesh-type bonnet, 87
Methacrylates, 238
Meth-acrylic acid copolymers drug delivery
 bottom spray process, 244–245
 gastro-resistant (*see* Gastro-resistant formulations)
 pan coating processes, 246
 pellet manufacturing, 247, 248
 tablet formulations, 246, 247
 top spray process, 245
MFFT. *See* Minimum film formation temperature (MFFT)
Microcapsules
 agglomeration, 141
 angle of repose (AOR), 142

- Microcapsules (*cont.*)
- Büchner funnel, 135
 - burst release, 145
 - carbonless copy paper, 120
 - characterization, 135, 136
 - CPT, 132, 139, 142, 144–146
 - CQAs, 132
 - data analysis, 137
 - EE, 142
 - emulsification and solvent evaporation
 - approach, 133
 - liquid paraffin, 130
 - packability and flowability parameters, 143
 - polymers and MCC, 134
 - properties, 130, 131
 - RSM, 132
 - SEM micrographs, 143, 144
 - types, 122
- Microclimates, 72
- Microcrystalline cellulose (MCC), 7, 8, 41, 134
- Microencapsulation
- benefits, 122
 - classification, 121
 - features, 122
 - oil-in-water solvent evaporation
 - process, 129
 - physico-chemical processes
 - coacervation phase separation, 124
 - hot melt, 124, 125
 - layer-by-layer polyelectrolyte deposition, 125
 - phase inversion, 125
 - solvent evaporation, 125, 126
 - physico-mechanical process
 - centrifugal extrusion, 127
 - fluidized-bed technology, 127
 - pan coating, 127
 - spray drying and congealing, 126
 - processes and particle size ranges, 124
 - spray drying, 123
 - sprinkles, 123
 - solvents selection, 131
 - vitamin C, 123
- Microsphere, 120, 121, 125, 126, 128, 130, 135, 145
- Minimum film formation temperature (MFFT), 272
- Mini-tablets, 4, 342–344, 347, 360
- applications, 114–115
 - aqueous ethyl cellulose ER system, 114
 - benefits, 97
 - commercial products, 97
 - disintegration testing, 104
 - dissolution testing
 - enteric-coated, 105, 106
 - ER film coating, 114
 - hydrophilic ER mini-matrices, 106, 108
 - hydrophilic mini-matrices, 107
 - paddle method, 104
 - DR (*see* Modified drug release applications)
 - hard-shell capsules, 102
 - IR and ER, 97
 - manufacture
 - coating, 101, 102
 - hot-melt extrusion, 101
 - particle size, 99
 - shear stress, 100
 - tooling, 98
 - mMTS, 104
 - MP, 96
 - pediatric application, 98
 - preschool-aged children, 98
 - release control, 97
 - solid and liquid formulation, 96
- MMM. *See* Magnetic marker monitoring (MMM)
- mMTS. *See* Mechanical Mini Tablet System (mMTS)
- Modified drug release applications
- delayed release, 109
 - extended release, 109–113
- MRI. *See* Magnetic resonance imaging (MRI)
- MSC. *See* Melt-spray-congealing (MSC) process
- Multidrug resistant (MDR) bacterial strains, 163
- Multiparticulates (MPs)
- APIs, 156, 163
 - children, 232
 - coating, 161
 - cores
 - bioavailability-enhancing drug forms, 160, 161
 - drug loading control, 160
 - processes and physical properties, 159
 - drug release mechanisms, 224 (*see also* Ethylcellulose (EC))
 - dosage forms, 162, 163
 - dual-release formulation, 164
 - modified release (MR) profiles, 156
- Multiuunit particulate systems (MUPS), 268

N

Near-infrared spectroscopy (NIR), 50, 304

O

ODF. *See* Orally disintegrating/dissolving formulation (ODF)

ODT. *See* Orally disintegrating tablets (ODT)

Oil-in-water solvent evaporation process, 129

On-line NIR, 304

Opadry[®] EC coating system, 283

Oral cavity and swallowing process, 180

Oral dosage forms, 120

Oral drug delivery, 1, 2

Oral multiparticulate systems

- colon, 364, 365, 382
- combined products, 172
- dissolution test (*see* Dissolution test method)
- DR multiparticulates, 171
- drug development process, 365
- ER formulations, 170
- esophagus, 361
- food, effect of, 374
- formulation performance, 365
- gamma scintigraphy (*see* Gamma scintigraphy)
- general differences between animal and rats, 365
- GI tract (*see* Gastrointestinal (GI) tract)
- ICH quality standards, 373
- institutional review boards, 373
- IntelliCap System, 372
- IR formulations, 170
- MMM, 370
- MRI, 371
- mucoadhesion, 365
- nasogastric pH probes, 372
- pharmaceutical technology, 360
- pharmacokinetic (PK) sampling, 372 (*see also* Effervescent floating multiparticulate system; Gastroretentive multiparticulates)
- small intestine, 363–364
- SR multiparticulates, 171
- stomach, 362–363
- taste-masked formulations, 173
- terminologies, clinical investigation, 373
- X-ray, 371

Orally disintegrating tablets (ODT), 256

Orally disintegrating/dissolving formulation (ODF), 180

P

Packability and flowability parameters, 143

Paediatric dosage forms, 218, 219, 221

Paediatric drug delivery

- characteristics
 - absorption, 215, 216
 - distribution, 217
 - elimination, 217
 - metabolism, 217
- definition, 214, 215
- population, 215
- use
 - adolescence, 219
 - duration of illness, 218
 - preterm infants, 215

Paediatric formulation

- excipients, safe use, 230, 231
- extemporaneous preparation, 230
- palatability, 225
- particle size, 231
- subunit functional coating, 229
- taste masking
 - film coating polymers, 226, 227, 229
 - HME, 225
 - human taste panels, 226
 - limitations, 226
 - physico-chemical modification, 228

Paediatric therapy. *See also* Paediatric formulations

- advantages and constraints, 222, 223
- classification, 215
- regulatory guidelines/recommendations, 219–220
- taste masking, 227, 228

Pan coating process, 127, 246

Particle image velocimetry (PIV), 57

Particles from gas-saturated solution (PGSS), 129

PAT. *See* Process analytical technologies (PAT)

PBPK. *See* Physiologically based pharmacokinetic (PBPK) model

PD. *See* Pharmacodynamics (PD)

Pellet coating process

- bimodal distributions, 325, 326
- calculation, 326, 327
- characteristic values, 321–324
- FLEX STREAM™ module, 327
- flow with increasing/decreasing of spray rate, 326, 327
- in-line Particle Probe IPP 70-S installation, 321

- Pellet coating process (*cont.*)
- number-based density
 - distributions, 323, 324
 - processes and process optimization, 323
 - size growth, 325
 - top, bottom and side/tangential spray, 320
 - twins and triplets, 323
 - volume-based density
 - distributions, 321, 322
 - Wurster configuration, 320
- Pelletization aid
- crospovidone, 44
 - disintegrating pellets, 44
 - DMSO, 42
 - MCC, 41, 42, 45
 - requirements, 44
 - wet mass, 41
- Pellets, 38
- density
 - bulk, 25
 - envelope, 24
 - true density, 24
 - dosators and pistons, 339
 - dosing accuracy, 342
 - double slide system, 339
 - dynamic image analysis, 16
 - gravimetric dosing, 339
 - materials and manufacturing, 8, 9
 - particle size distributions, 11, 13, 15, 19, 20
 - product quality, 7
 - QbD principles, 18
 - robustness and processability, 31, 32
 - shape, 26, 27
 - static image analysis, 16
 - sugar spheres, 17
 - surface area, 10, 11
 - surface morphology, 28, 30
 - vacuum-assisted dosing, 341
 - volumetric dosing, 342
 - volume vs. number distribution, 21–23
- PGSS. *See* Particles from gas-saturated solution (PGSS)
- Pharmaceutical gamma scintigraphy imaging
- GI transit, ambulatory subjects, 369
 - image analysis, 369
 - procedures, 369
- Pharmacodynamics (PD), 156
- Pharmacokinetics (PK), 3, 156
- Phase inversion microencapsulation, 125
- Physiologically based pharmacokinetic (PBPK) model, 206
- Pilot-scale Wursters, 88
- PIV. *See* Particle image velocimetry (PIV)
- Plasticizers
- chlorpheniramine maleate release profiles, 278, 279
 - drug release from EC films, 277, 278
 - film pliability, 276
 - free film modulus and stress values, 277
 - glass transition (T_g), 277
 - optimum plasticization, 277
 - PEG efficiency, 276
 - permeability coefficient, 277
 - solubility parameters, 276
 - types, 276
 - water-soluble and water-insoluble, 277
- Polymer encapsulation, 128, 129
- Poly(meth)acrylates
- EUDRAGIT[®], 238
 - film formation, 242–243
 - methacrylates, 238
 - physicochemical properties, 240, 241
 - structure and functionality, 238, 239
- Powder dosing, 339
- Predictive dissolution methods
- biorelevant dissolution system, 188
 - drug dissolution and release, 187
 - GI tract, 188
 - physiological (*see* Gastrointestinal (GI) tract)
 - requirements, 177
- Process analytical technologies (PAT), 49–50, 302, 303
- Process interface
- defined, 317
 - in-line Disperser D11, 319
 - in-line SFT Probe IPP 70 with disperser D23, 318
 - long service life between cleaning intervals, 317
 - purge cells and dispersers, 318
- Pulsatile delivery systems, 200, 201
- Q**
- Quality by design (QbD), 132, 158, 302, 316
- acetaminophen release profiles, 290
 - ETHOCEL variation, 290, 291
 - ETHOCEL-coated multiparticulates, 291, 294
 - metoprolol tartrate release, 290, 293
- R**
- Radiolabeling technique
- dual-isotope imaging, 369

- erosion kinetics, 368
- GI transit, multiparticulates, 368
- neutron activation method, 367
- pellet transit behavior, 368
- radiolabeled enteric-coated delayed release dosage form, 368
- sorption method, 367
- in vitro evaluation, 368
- Rapid expansion of supercritical solution (RESS), 129
- Release profile, 170, 172, 174, 177, 198, 202, 204, 205
- Release profile control, 160
- Response surface methodology (RSM), 132
- Rotor/centrifugal processing, 73–76

- S**
- SFT. *See* Spatial filtering technique (SFT)
- Simulated colonic fluid (SCoF), 195
- Simulated saliva fluids (SSFs), 192
- Single-unit dosage forms, 120
- Site-specific delivery systems, 171, 198
- Small intestinal physiology, 184–185
- Small intestinal transit time (SITT), 369
- Small intestine
 - formulation scientist, 364
 - gastric emptying rate, 363
 - intestinal transit conditions, 363
 - segmentation and peristalsis, 363
- Softgel, 345
- Solid lipid extrusion, 39
- Solvent evaporation approach, 126, 149
- Solvent system
 - binary mixtures, 275
 - description, 274
 - organic solvent residues, 275
 - phase separation principle, 275
 - polymer coils, 274
 - solubility parameters, 274
 - variety of, 274
- Spatial filtering technique (SFT)
 - fluid particles population, 308
 - impulse generation, spot scanning, 309, 310
 - laser Doppler anemometry, 309
 - optical fibres, 310, 311
 - parameters, 312
 - principle, 308, 309
 - types of, 309
- Spheronization
 - applications, 58, 59
 - equipment, 50–51
 - mechanism, 52–54
 - process variables
 - DEM, 58
 - friction plate speed, 56
 - material load, 56
 - pelletization aid, 55
 - PIV, 57
 - powder formulation, 54
 - residence time, 56
 - water, 55
 - Spray-drying approach, 123, 126
 - Spray granulation, 75
 - Sprinkles, 123, 222, 224
 - SQUIDs. *See* Superconducting quantum interference devices (SQUIDs)
 - SSFs. *See* Simulated saliva fluids (SSFs)
 - Stomach
 - array of biopharmaceutical interactions, 362
 - floating multiparticulates, 362
 - magenstrasse influence, 363
 - median pH values, 362
 - MMC phases, 363
 - rate of gastric emptying, 362
 - Sugar sphere, 7
 - friability values, 33
 - monograph specification, 8
 - particle size, 11, 14
 - tensile strength, 32
 - Superconducting quantum interference devices (SQUIDs), 370
 - Sustained-release (SR) multiparticulate formulations, 171–172
- T**
- Tablet formulations, 246, 247
- Target product profile (TPP), 132
- Taste masking
 - antimalarial quinine sulfate, 256
 - EUDRAGIT E PO, 257
 - film coating polymers, 226, 227, 229
 - formulations, 173
 - HME, 225
 - human taste panels, 226
 - moisture-protective coating, 257
 - ODT, 256
 - physico-chemical modification, 228
- Theoretical capsule fill weights, 25
- Top spray process, 67, 68, 245

U

USP dissolution methods, 175

V

Vacuum-assisted pellet dosing, 341

Versatile dosage forms, 222

Viscosities

- Dow Chemical Company, 270
- pharmacopeia specification, 270
- polymer molecular weight, 271
- product nomenclature, 270
- and substitution ranges, pharmaceutical applications, 270

W

Weight control approaches, 350

Wet extrusion, 38

Wet pellets, 38

Wurster bottom spray, 69, 84

Wurster system, 68, 70, 71

X

X-ray-based system, 353

X-ray technology, 353

Z

Zanasi Lab 16, 103