

Index

a

- absorption, selective 367
- accelerated tests 443
- acids, fatty 69
- activity coefficient 42–43
- adhesion tension 372
- adhesion wetting 377
- adsorbed ions, (non)specific 104–105
- adsorbed layers 170
 - thickness 89–92, 281
- adsorbed surfactants
 - nonionic 115–124
 - steric stabilisation 239–246
- adsorption
 - diblock copolymers 95–97
 - diffusion-controlled kinetics model 381
 - dynamics of processing 380–384
 - effect on powder wetting 374–375
 - energy per segment 79
 - Gibbs equation 174, 177, 308
 - kinetic measurements 384–387
 - polymer 77–99, 80–87, 98
 - saturation 59, 178
 - surfactants 11, 55–75, 139–141, 172–183
 - temperature dependence 94
- adsorption isotherms
 - dispersants 391–392
 - Gibbs 57–60, 374
 - log–log presentation 84
 - measurements 88–89
 - nonionic surfactants 73, 92–98
 - oligomers 84
 - polymers 84
 - solid/liquid interface 67
- Aerosol OT 259, 305, 380
- AFM (atomic force microscopy) 410
- agents
 - antifoaming 6
 - dispersing 139
 - emulsifying 185
 - “structuring” 440
 - surface-active, *see* surfactants
 - wetting 129, 210, 379–380
- agglomerates 209, 376
 - breaking 260, 387–388
- aggregates 376
 - breaking 260, 387–388
- aggregation
 - aggregation number 31
 - stepwise 383–384
- agrochemicals 219–230
- air/liquid interface 56–66
- air/water interface 58, 239
- alcohols
 - ethoxylates 19, 141, 216
 - sulphate formulation 15
 - three-component phase diagram 305
- aliphatic hydrocarbons 365
- N*-alkyl amino propionates 18
- alkyl benzene sulphonates, linear 15
- N*-alkyl betaines 17
- alkyl chains
 - adsorbed layers 170
 - branched 259
 - length 38, 289
 - mobility 31
- alkyl naphthalene formaldehyde, sulfonated 53
- alkyl phenol ethoxylates 19–20
- alkyl polyglucosides (APGs) 23–24
- alkyl sulfoxide 38
- alumina 71
- amine ethoxylates 21
- amine oxides 21
- amino propionates, *N*-alkyl 18
- ammonium bromide, CTAB 456–457

- ammonium compounds, quaternary 16
 - amphipathic graft copolymer 352
 - amphiphilic molecules 11
 - amphoteric surfactants 17–18
 - anchor chain 360
 - anchor segment 95–97
 - anchoring, “rejection” 237
 - anemometry, laser 404
 - anionic surfactants 13–16
 - emulsion polymerisation 347
 - surfactant mixtures 42–43
 - antifoaming agents 6
 - antifoaming chemicals 335–336
 - antisolvents, solvent–antisolvent method 255
 - antithixotropy 426–428
 - aqueous phase 444
 - aqueous polystyrene (PS) latex 446–448
 - Arlatone V-100 451
 - Arrhenius equation 443
 - assessment
 - creaming and sedimentation 443–452
 - dispersants 391–394
 - emulsion coalescence 459–463
 - flocculation 405–410, 438–442, 452–458
 - sedimentation of suspensions 403–405
 - suspension stability 149
 - athermal solvents 86
 - Atlox 4913 355–357
 - atomic force microscopy (AFM) 410
 - attenuated total reflection (ATR) 89
 - autocorrelation function 416–417
 - β -casein 178
 - dilational modulus 180
- b**
- back-scattering techniques 418
 - backbone
 - chain length 353
 - inulin 53, 293
 - PMMA 215, 222–223, 389
 - balance, HLB, *see* hydrophilic–lipophilic balance
 - Bancroft rule 181
 - batch-wise preparation 176, 275
 - bead milling 220, 393–394
 - bending, films 304
 - Bessel function 414
 - BET (Brunauer–Emmett–Teller) equation 80
 - betaines, N-alkyl 17
 - Bingham equation 357
 - Bingham plastic systems 425
 - block copolymers 50–51
 - architecture 215
 - configurations 360
 - conformation 239
 - emulsion polymerisation 349–352
 - PHS-PEO-PHS 238–242
 - PS-PEO 349
 - synperonic PE 225–227
 - block type polymeric surfactants 237
 - Born repulsion 108–109, 133, 168
 - bottom-up processes 4
 - nanosuspensions 251, 254–257
 - Brag–Williams approximation 82
 - branched alkyl chain 259
 - break point 173
 - breakage of hydrogen bonds 94, 350
 - breakdown, emulsions 165–166, 233–235
 - breaking, aggregates and agglomerates 260, 387–388
 - bridging flocculation 145–146, 267
 - Brownian diffusion 145, 244
 - Brunauer–Emmett–Teller (BET) equation 80
 - bubbles
 - bubble zone 327
 - formation 326
 - maximum bubble pressure method 384–386
 - bulk molecules 253
 - bulk powder wetting 257–259
 - bulk properties, suspensions 152–158, 397
 - Bulkley, *see* Herschel–Bulkley equation
 - buoy segment 95–97
 - buoyancy 147, 326
 - Buxis chinensis* 296
- c**
- cakes 125, 147
 - calculation
 - droplet size 313–314
 - zeta potential (ζ) 136–137
 - capillaries
 - fine 130
 - flow 386
 - horizontal 258, 377
 - capillary pressure, Laplace 331
 - carbon black surfaces 70
 - carboxylates 13–14
 - carrier oil 217
 - Cassie’s equation 373
 - Casson model 426
 - castor oil 296
 - cationic surfactants 16–17
 - clay flocculation 456–457
 - emulsion polymerisation 347

- surfactant mixtures 42–43
- ccc, *see* critical coagulation concentration
- cellulose, HEC/EHEC 154–155, 449
- CER (cohesive energy ratio) concept 320–322
- cetyl trimethyl ammonium bromide (CTAB) 456–457
- cfc (critical flocculation concentration) 194–195
- CFT, *see* critical flocculation temperature
- chain–chain interaction, cohesive 140
- chains
 - alkyl, *see* alkyl chains
 - anchor 360
 - backbone, *see* backbone
 - dangling 264
 - length 38
 - oligomeric 362
 - side-chain length 352–353
 - stabilising 45, 360
- Chapman, *see* Gouy–Chapman theory
- characteristic ratio 47
- characterisation
 - microemulsions 311–317
 - multiple emulsions 247–248
 - suspensions 149, 397
- charge, surface 398
- charge-stabilised emulsions 196
- chemical inhibitors 335
- chemical potential, standard 35–36
- chlorothalonil 219–222
- clays 125, 147, 153–156
 - particles 103
 - restabilisation 456–457
- cloud point (CP) 19
- cloud point curve 307
- CLSM (confocal laser scanning microscopy) 151, 409
- cmc, *see* critical micelle concentration
- coagulated suspensions 146
- coagulation concentration 110, 263
 - critical, *see* critical coagulation concentration
- coagulative nucleation theory 346, 349
- coalescence 162–163
 - correlation with elastic modulus 462–463
 - emulsions 198–200, 203–204, 459–463
 - flocculation assessment 453
 - multiple emulsions 234
 - rate 200
- coarse suspensions 146
- coherence area 274
- cohesive chain–chain interaction 140
- cohesive energy 463
- cohesive energy density 436, 451
- cohesive energy ratio (CER) concept 320–322
- coil
 - overlap 448
 - random 47
- collapse, foams 343
- colloids
 - colloidal particles 133
 - nano- 251
 - protective 360
 - stability 101–114
- colour cosmetics 207–219
- coloured pigments 205, 367
- combined surfactants 308–309
- comminution 216, 260–261
 - deagglomeration 392–394
- common film (CF) 331–332
- compact sediments 125, 147
- complete wetting 370
- complex modulus 225–226, 245, 248–249
 - formulation evaluation 433–436
 - latexes 359
 - vector analysis 434–436
- compliance 430
 - flocculation assessment 439
- compressibility, foams 338
- compression
 - liquids 382
 - without interpenetration 116
- concentrated suspensions 144–149
- condensation method 46, 126
- conductivity
 - microemulsion characterisation 315–316
 - oils 200
 - temperature dependence 286, 320
- configurational entropy 116–119
 - elastic interaction 266
 - nanoemulsions 281
 - steric stabilisation 142
- configurations
 - block copolymers 360
 - number of 266
- confocal laser scanning microscopy (CLSM) 151, 409
- conformations
 - block copolymers 239
 - macromolecules 78
- consolidation 421
- constant stress measurements 423, 429–432
 - flocculation assessment 453–454
- constant stress rheometer 437
- constrained regulation method 418
- contact angle 128
 - foams 339

- contact angle (*contd.*)
 - measurements 378–379
 - powder wetting 370–373
 - Young's equation 208
 - continuous phase 363–364
 - continuous preparation 176, 275
 - “contrast-matching” method 89
 - control
 - flocculation 420
 - particle size distribution 252–254
 - copolymers
 - architecture 215
 - block, *see* block copolymers
 - “comb” 356, 361
 - configurations 360
 - diblock 95–97
 - graft 52
 - solution properties 50
 - correlation delay time 274
 - correlation function, photocount 314
 - cosolutes 29
 - cosurfactants 301, 303
 - conductivity behaviour 316
 - partitioning 322
 - pseudoternary phase diagram 306
 - Coulter counter 419
 - counterions 103
 - CP (cloud point) 19
 - creaming 161–162
 - assessment and prediction 443–452
 - creep measurements 450–451
 - emulsions 187–192, 449–450
 - oscillatory measurements 451–452
 - suspoemulsions 221
 - creep measurements 423, 429–432
 - creaming prediction 450–451
 - flocculation assessment 439, 453–454
 - critical coagulation concentration (ccc) 112, 134, 264, 354
 - critical flocculation concentration (cfc) 194–195
 - critical flocculation temperature (CFT) 122, 144
 - latexes 359–360, 364
 - critical micelle concentration (cmc) 27–28
 - surfactant mixtures 41
 - temperature dependence 30, 33
 - critical packing parameter (CPP) 31
 - critical strain 435, 463
 - Cross equation 426
 - crystal growth
 - assessment 405–410
 - measurements 420
 - prevention 268
 - crystallisation, suspoemulsions 204
 - CTAB (cetyl trimethyl ammonium bromide) 456–457
 - cubes 368
 - cumulant method 417
 - curvature effects 284
 - cyclohexane 278
 - cylinder, elongated 66
- d**
- dangling chains 264
 - dangling “tails” 294
 - dead time 384
 - deagglomeration 387–388
 - deaggregation 206
 - Debye, RGD regime 412
 - Debye force 106, 132, 166–167
 - Debye length, reciprocal 261
 - Debye parameter 92
 - decaglycerol decaoleate 236
 - decane 277
 - defoamer 6
 - defoaming 336
 - deformation, droplets 179–183
 - deformed layer 444
 - depletion flocculation 122–123, 145–149
 - sedimentation prevention 157
 - Deryaguin–Landau–Verwey–Overbeek (DLVO) theory 109–111
 - emulsion formulation 169–170
 - nanosuspensions 261–262
 - surface forces 331
 - suspension formulation 133
 - desorption 381
 - detachment, moment of 385
 - deuterated PS latex 96
 - diamine, ethylene 51
 - diblock 50–51
 - copolymers 95–97
 - molecular weight effect 351
 - dichlobutrazol 219–222
 - diethylhexyl sulfosuccinate, *see* Aerosol OT
 - differential interference contrast (DIC) microscopy 150
 - formulation evaluation 407
 - diffraction, light-diffraction techniques 413–415
 - diffuse double layer 103
 - diffusion
 - adsorption kinetics model 381
 - Brownian 145, 244
 - diffusion coefficient 274, 417
 - oils 197
 - self- 317

- surface 382
 - dilatant sediments 153–156
 - dilatant systems 425
 - dilation, liquids 382
 - dilational elasticity, Gibbs 6, 295
 - dilational modulus
 - interfacial 178
 - surface 330
 - dilution
 - formulation evaluation after 397–421
 - microemulsions 279–281
 - dipole–dipole interaction, *see* Keesom force
 - disjoining pressure 198, 331–334
 - dispersants 45–54, 387
 - assessment and selection 391–394
 - classification 388–394
 - dispersant demand curve 218
 - disperse systems 101–114
 - stability 115–124
 - dispersing agents 139
 - dispersion force, London 106, 132, 166–167, 261
 - dispersion method 46, 126
 - suspension preparation 128–152
 - dispersion polymerisation 207, 360–365
 - latexes 2, 345
 - dispersion wetting 377
 - dispersions
 - hard-sphere 240, 312
 - liquid/liquid, *see* emulsions
 - pigment/ink 5, 205–206, 367–395
 - preformed 356–360
 - PS 447
 - rheology 213
 - solid/liquid, *see* suspensions
 - stabilisation 113, 261–267
 - sterically stabilised 457–458
 - surfactants 11–25
 - disproportionation 162
 - dissolution, micelles 383–384
 - distorted polyhedral oil droplets 444
 - dividing line, Gibbs 164–165
 - DLS (dynamic light scattering) 415–418
 - DLVO theory, *see* Deryaguin–Landau–Verwey–Overbeek theory
 - dodecane 280
 - dodecyl sulphate 28
 - sodium, *see* sodium dodecyl sulphate
 - Doppler measurements, LDV 405
 - Doppler shift frequency 138
 - double layers
 - electrical, *see* electrical double layers
 - extended 310
 - measurements 398–400
 - Dougherty–Krieger equation 154, 227
 - latexes 358
 - residual viscosity 447
 - drainage
 - chemical inhibitors 335
 - foam films 329
 - foams 342–343
 - droplets
 - antifoaming 336
 - deformation 179–183
 - drop volume/weight method 65
 - interdroplet interaction 315
 - internal 233
 - polyhedral oil 444
 - size calculation 313–314
 - size measurements 247–248
 - dry foams 339
 - du Nouy's technique 63–65
 - Duhem, *see* Gibbs–Duhem equation
 - duplex film theory 309
 - duplex films, “flat” 303
 - dynamic light scattering (DLS) 314–315, 415–418
 - dynamic measurements 245
 - flocculation assessment 454–456
 - formulation evaluation 423, 432–442
 - dynamic viscosity 225–226, 434
 - dynamics of processing, adsorption and wetting 380–384
- e**
- eddies, turbulent 176
 - effective radius 377
 - effective Hamaker constant 107–108, 133, 167, 261
 - effective steric stabilisation 120–121
 - effective volume fraction 213
 - EHEC (ethyl hydroxy ethyl cellulose) 154–155
 - residual viscosity 449
 - Einstein, *see* Stokes–Einstein equation
 - elastic interaction 266
 - adsorbed nonionic surfactants 118–119
 - elastic modulus 225–226, 228
 - correlation with coalescence 462–463
 - formulation evaluation 433–436
 - latexes 359
 - elastic response 429, 432
 - elasticity
 - Gibbs 198, 287
 - Gibbs coefficient of 330
 - interfacial 6
 - theory 330

- electrical double layers 101–114
 - emulsions 168–170
 - overlap 169
 - repulsion 105–106, 132
 - structure 103–104
 - suspension preparation 131–138
- electrical properties, foams 340
- electrical resistance 316
- electrokinetic measurements 399
- electrokinetic phenomena, zeta potential (ζ) 135
- electrokinetic properties, foams 340
- electrolytes 29
 - electrical double layers 104
 - nonadsorbed 60
- electromagnetic fluctuations 108
- electron microscopy 151, 408
- electrophoretic mobility 456
- electrostatic repulsion 167–170
- electrostatic stabilisation
 - emulsions 113, 193–195
 - energy-distance curves 211
- electrosteric stabilisation 211
- ellipsoids, prolate 66
- ellipsometry 89
- elongated cylinder 66
- Emmett, *see* Brunauer–Emmett–Teller equation
- emulsification
 - mechanisms 174–175, 273–275
 - methods 175–177, 275
 - oils 183
 - self- 279
 - spontaneous 65
- emulsifiers 180
 - microemulsions 317–318
 - multiple emulsions 232, 235–236
 - selection 183–187
- emulsifying agents 185
- emulsion polymerisation 207
 - latexes 2, 345–356
 - mechanism 348–349
 - stabilisers 349–356
 - surfactants 347
- emulsions 2, 55
 - charge-stabilised 196
 - coalescence 198–200, 203–204, 459–463
 - creaming 187–192, 449–450
 - droplet interactions 166–172
 - electrostatically stabilised 113
 - flocculation 192–195
 - formation thermodynamics 165–166
 - formulation 161–202
 - hexadecane 227–230
 - industrial applications 163
 - micro-, *see* microemulsions
 - mini-, *see* miniemulsion
 - multiple, *see* multiple emulsions
 - nano-, *see* nanoemulsions
 - phase inversion 200–201
 - physical chemistry 164–172
 - rheology 187
 - role of surfactants 177–178
 - sedimentation 187–192
 - stabilisation 193–195
 - steric stabilisation 171, 458
 - suspoemulsions 3, 203–230
- end-to-end distance, mean 47
- energy
 - cohesive 320–322, 463
 - cohesive energy density 436, 451
 - free energy path 166
 - Gibbs free energy 252
 - surface 372
 - van der Waals 243, 261
- energy barrier
 - emulsion breakdown 165–166
 - flocculation 111, 113, 134–135, 193, 210
- enhanced steric stabilisation 144
- enthalpy, micellisation 37–43
- enthalpy of mixing 48
- entropy
 - configurational, *see* configurational entropy
 - micellisation 37–43
- equation of state approach 60–62
- equilibrium
 - micellisation 35–37
 - sediment volume 420–421
- esters
 - carboxylates 13
 - nanoemulsions 297–298
 - sorbitan 20–21
- ethers, stearyl 298
- ethoxylates
 - alcohol 141, 216
 - ethoxylated fats and oils 21
 - nonionic surfactants 19–20
 - nonylphenol 278
- ethyl hydroxy ethyl cellulose (EHEC) 154–155
 - residual viscosity 449
- ethylene diamine 51
- ethylene oxide (EO) units 12, 14–15, 18
- evaluation
 - formulations after dilution 397–421
 - formulations without dilution 423–442
- expulsion 234
- extended double layer 310

- extenders 369
- external oil drops 233
- external phase 219
- f**
- fats, ethoxylated 21
- fatty acid ethoxylates 20
- FFG (Frumkin–Fowler–Guggenheim)
 - equation 69, 140
- films
 - bending 304
 - CF 331–332
 - duplex film theory 309
 - film formers 205–206
 - “first black” 332
 - “flat” duplex 303
 - foam 329
 - interfacial 197, 284
 - MFFT 346–347
 - mixed-film theories 303–305
 - mixed surfactant 199
 - rupture 333–334
 - thickness fluctuations 333
 - vertical 329
 - viscoelastic 244
- fine capillaries 130
- first-order Bessel function 414
- Fleer, *see* Scheutjens–Fleer theory
- flexible macromolecules 46
- flocculation 45
 - assessment 405–410, 438–442, 452–458
 - bridging 145–146, 267
 - CFT 122, 144, 359–360, 364
 - clays 456–457
 - “controlled” 420
 - depletion, *see* depletion flocculation
 - DLVO theory 110
 - emulsion formulation 162
 - emulsions 192–195
 - heteroflocculation 204
 - homoflocculation 203
 - incipient 121–122, 143, 419–420
 - kinetics 418
 - rate measurements 418–419
 - reduction 196
 - reversible 147
 - steric stabilisation 121–123, 143–144, 457–458
 - suspensions 111–113, 134–136
 - weak 121, 143, 145–147, 455
- Flory–Huggins interaction parameter 79
- Flory–Huggins theory 48–49
 - polymer adsorption 83
- Flory–Krigbaum theory 242, 265
- flow
 - laminar 176–177
 - Marangoni 382
 - osmotic 234–235
 - time effects 426–428
 - viscous 245
- flow behaviour, thickeners 448
- flow capillary 386
- flow curves 424–426
- flow ultramicroscopy 419
- fluctuations
 - films thickness 333
 - spontaneous electromagnetic 108
 - surface 198
- fluids, viscous 430
- fluorescence recovery after photobleaching (FRAP) 341
- fluorocarbon surfactants 22–23
- foam films, drainage and thinning 329
- foam inhibitors 335–338
- foams 5–9
 - drainage 342–343
 - formulation 325–344
 - measurements 341–343
 - physical properties 338–341
 - preparation 326
 - spherical 327
 - stability 328–335
- formaldehyde, sulfonated alkyl naphthalene 53
- formation
 - micelles 383–384
 - spontaneous 307
 - thermodynamic theory 307–310
- formulation
 - emulsions 161–202
 - foams 325–344
 - latexes 345–365
 - microemulsions 301–323, 318–322
 - multiple emulsions 231–249
 - nanoemulsions 271–300
 - pigment and ink dispersions 367–395
 - suspensions 125–160
 - suspoemulsions 203–230
- formulations
 - evaluation after dilution 397–421
 - evaluation without dilution 423–442
 - separation 445–446
- Fourier transform lens 413
- Fowler, *see* Frumkin–Fowler–Guggenheim
- equation
- fraction of segments 89
- FRAP (fluorescence recovery after photobleaching) 341

Fraunhofer diffraction theory 413–415
 free coil 448
 free energy path 166
 frequency sweep 434–436
 Frumkin equation 62–63
 Frumkin–Fowler–Guggenheim (FFG)
 equation 69, 140
 Fuchs, *see* von Smoluchowski–Fuchs theory

g

Gans, *see* Rayleigh–Gans–Debye regime
 gas cells, polyhedral 327
 gases, two-dimensional 61
 gels 148
 – “three-dimensional” network 222
 gemini surfactants 23
 Gibbs adsorption equation 174, 177
 – cosurfactants 308
 Gibbs adsorption isotherm 57–60, 374
 Gibbs coefficient of elasticity 330
 Gibbs convention 56
 Gibbs dilational elasticity 6, 295
 Gibbs dividing line 164–165
 Gibbs–Duhem equation 56–57, 164
 Gibbs elasticity 198, 287
 Gibbs equation 375
 Gibbs free energy 252
 Gibbs–Marangoni effect 181–182
 – theory 330–332
 glass transition temperature 204–205
 glycerol 51, 296
 glyceryl monostearate 184
 glycol monoether, octylhexaoxyethylene
 37–38
 Gouy–Chapman theory 103–104, 131
 graft copolymers 52
 – amphipathic 352
 – architecture 215
 – configurations 360
 – emulsion polymerisation 352–356
 graft type polymeric surfactants
 237
 grafted PEO chains 227–230
 Grahame, *see* Stern–Grahame model
 Graphon 70
 “grinding stage” 387
 grinding time 393
 group number, HLB 185
 growth
 – crystal, *see* crystal growth
 – irreversible 127, 254
 – nucleation and 126–127, 252–254
 Guggenheim, *see* Frumkin–Fowler–
 Guggenheim equation

gum, xanthan, *see* xanthan gum
 gyration, radius of 47

h

half-life
 – emulsion flocculation 194
 – suspension flocculation 111–112
 Hamaker constant 107–108, 133, 167, 261
 – nanoemulsions 282
 hard-sphere dispersions 240, 312
 Hardy, *see* Schultze–Hardy rule
 haze point curve 307
 head group, polar 12
 heat of vaporisation 321
 HEC (hydroxyethyl cellulose) 154
 Helmholtz plane 104–105
 hemi-micelles 72, 74
 Henry region, linear 85
 Henry’s law isotherm 61
 Henry’s treatment 137
 Herschel–Bulkley equation 426
 Herschel–Bulkley model 458
 heteroflocculation 204
 heterogeneous nucleation 326
 hexadecane 227–230, 284–290
 hexagonal lattice 84
 hexanol 280
 – static light scattering 312–313
 high-affinity isotherm 391, 402–403
 high-gravity (g) forces 444
 high-molecular-weight thickeners 157
 high-pressure homogenisation 224, 272,
 276, 292
 high-speed centrifuge 443
 high-speed stirrers 273
 HLB-temperature 278–279, 286–288
 homodyne 416
 homoflocculation 203
 homogeneous nucleation 326
 homogenizer 182
 homopolymers 50, 389
 horizontal capillaries 258, 377
 horizontal mills 394
 Hückel equation 137–138
 Huggins, *see* Flory–Huggins theory
 humectants 296
 hydrated layer, PEO 292
 hydrocarbons
 – aliphatic 365
 – hydrocarbon oil nanoemulsions 294
 – transfer of 39
 hydrodynamic thickness 93–94, 115–116
 hydrodynamic volume 457–458
 hydrogen bonds, breakage 94, 350

hydrometer 403
 hydrophilic–lipophilic balance (HLB)
 number 3
 – emulsifier selection 183–187
 – microemulsions 318–319
 – optimal 318
 – PIT concept 277–278
 – sorbitan esters 21
 – surfactant mixtures 40
 hydrophobic effect 39
 hydrophobic particles, antifoaming 337–338
 hydrophobic pigments 379–380
 hydrophobic surfaces 68–71
 hydroxyethyl cellulose (HEC) 154
 Hypermer CG-6 356–358

i

ideal surface film 61
 imidazolines 17
 immersion time 377–378
 immersion wetting 377
 incipient flocculation 121–122, 143
 – measurements 419–420
 industrial applications, emulsions 163
 “inert” fine particles 157
 inert oils 225
 inhibitors, foam 335–338
 initiation, monomer 362
 ink dispersions 5
 – formulation 367–395
 insoluble solids 1
 interdroplet interaction 315
 interfaces
 – air/liquid 56–66
 – air/water 58, 239
 – Gibbs dividing line 164–165
 – interfacial area 313–314
 – liquid/liquid 56–66, 172–183
 – oil/water 58, 239
 – saturation 173
 – solid/liquid, *see* solid/liquid interface
 – surfactant adsorption 55–75
 interfacial dilational modulus 178
 interfacial elasticity 6
 interfacial films 197, 284
 interfacial tension 11
 – Gibbs–Duhem equation 57
 – gradients 179
 – measurements 63–66
 – mixed-film theories 304
 – nanosuspensions 253
 – PIT concept 186, 278
 – temperature dependence 320
 intermolecular attraction 320

internal droplets 233
 internal phase 219
 interpenetration without compression 116
 inulin backbone 53, 293
 INUTEC® SP1 52–53, 223–225, 294–295,
 298, 354–356
 – latexes 354–356
 inverse micelles 302, 310
 inversion point, CER concept 321
 ionic surfactants 13–18
 – adsorption on hydrophobic surfaces 68–71
 – adsorption on polar surfaces 71–72
 ions, (non)specific adsorbed 104–105
 irreversible growth 127, 254
 “islands of spots” 332
 isoelectric point 71
 isohexadecane nanoemulsions 284–290
 isomorphic substitution 102–103
 isoparaffinic oils 225–227
 isopropyl alkylate 295
 isopropyl myristate 235
 isotherms
 – adsorption, *see* adsorption isotherms
 – Henry’s law 61
 – high-affinity 391, 402–403
 – Langmuir 382, 391, 401
 – solid/liquid interface 67
 – Stern–Langmuir 68

j

jojoba 296

k

Keesom force 106, 132, 166–167
 Keltrol 246–247
 Kelvin equation 224
 – formulation evaluation 420
 – nanoemulsions 283
 – nanosuspensions 251, 268
 Kelvin retardation time 431
 kinetics
 – diffusion-controlled model 381
 – emulsion polymerisation 348
 – kinetic stability 282
 – micelles 383–384
 – micellisation 34–35
 – polymer adsorption 98
 Kiss, *see* Princen–Kiss model
 Krafft temperature 32–33, 35
 Krieger, *see* Dougherty–Krieger equation
 Krigbaum, *see* Flory–Krigbaum theory
 Kruss instrument 259
 “Kugelschaum” 327

I

- LABSs (linear alkyl benzene sulfonates) 15
 - lamella thickness 330
 - lamellar liquid crystalline phases 199, 334
 - lamellar micelles 32
 - laminar flow 176–177
 - Landau, *see* DLVO theory
 - Langmuir, Stern–Langmuir isotherm, *see* Stern–Langmuir isotherm
 - Langmuir equation 62–63
 - linearised form 401–402
 - Langmuir isotherm 382, 391, 401
 - Langmuir–Szyszkowski equation 382
 - Laplace capillary pressure 331
 - Laplace equation 387
 - Laplace pressure 164, 177
 - laser anemometry 404
 - laser Doppler velocity (LDV) measurements 405
 - laser velocimetry technique 138
 - lateral repulsion 59
 - latexes 2
 - deuterated PS 96
 - formulation 345–365
 - glass transition temperature 204–205
 - model suspoemulsion 225–230
 - PMMA 350–352
 - preformed dispersions 356–360
 - lattice
 - hexagonal 84
 - polymer 46
 - quasi-crystalline 83
 - standard 414
 - layers
 - adsorbed, *see* adsorbed layers
 - deformed 444
 - electrical double, *see* electrical double layers
 - extended double 310
 - hydrated 292
 - “oily” 231
 - overlap 117
 - steric 213
 - thickness 89–92, 281
 - lens, Fourier transform 413
 - Lifshitz–Slesov–Wagner (LSW) theory 283, 290
 - light-diffraction techniques 413–415
 - light scattering
 - dynamic 314–315
 - formulation evaluation 411–412
 - stability assessment 151–152
 - time-average (static) 311–313
 - linear alkyl benzene sulfonates (LABSs) 15
 - linear Henry region 85
 - liquid crystalline phases 34, 158
 - lamellar 199, 334
 - three-component phase diagram 305
 - liquid-like particles 1
 - liquid/liquid dispersions, *see* emulsions
 - liquid/liquid interface 56–66
 - surfactant adsorption 172–183
 - liquids
 - contact angle measurements 378–379
 - non-Newtonian 448
 - powder wetting 375–377
 - pure 325
 - viscoelastic 430
 - wetting of powders 129–131
 - loading, solids 214
 - London dispersion force 106, 132, 166–167, 261
 - loop test 427
 - “loops” 77, 81–83
 - SF theory 87
 - loss modulus 225–226
 - formulation evaluation 433–436
 - latexes 359
 - LSW (Lifshitz–Slesov–Wagner) theory 283, 290
- m**
- Macadamia ternifolia* 296
 - macromolecules, flexible 46
 - macroscopic contact angle 373
 - manometric methods 404
 - Marangoni effect 6, 179
 - Gibbs– 181–182, 330–332
 - Marangoni flow 382
 - marker, water-soluble 232
 - Master Sizer 394, 414
 - maximum bubble pressure method 384–386
 - maximum wetting 371
 - Maxwell model 435
 - mean end-to-end distance 47
 - mean field approximation 82
 - measurements
 - adsorption isotherms 88–89
 - adsorption kinetics 384–387
 - constant stress (creep) 423, 429–432
 - contact angles 378–379
 - droplet size 247–248
 - dynamic (oscillatory) 245, 423, 432–442, 454–456
 - electrokinetic 399
 - foams 341–343
 - incipient flocculation 419–420
 - LDV 405
 - NMR 316–317

- Ostwald ripening 420
 - rate of flocculation 418–419
 - rheological 152, 248–249, 423–442
 - steady-state 423
 - turbidity 413
 - viscosity 460–461
 - wettability 377–378
 - zeta potential (ζ) 71–72, 137–138, 399
 - mechanical properties, foams 338–339
 - metastable foams 328
 - metastable solutions 126–127
 - methyl methacrylate (MMA) 346
 - micelles 11–12
 - cmc 27–28
 - formation driving force 38–40
 - inverse 302, 310
 - micellar solutions 301
 - mixed 40–43
 - molecular motion 317
 - “monomer-swollen” 346
 - nanoemulsions 287
 - powder wetting 383–384
 - shape 32
 - spherical 28, 32
 - stabilisation by 334
 - “swollen” 301
 - micellisation 27–44
 - thermodynamics 33–37
 - microbalance 259
 - microelectrophoresis 137–138
 - microemulsions 5, 55
 - characterisation 311–317
 - dilution of 279–281
 - formulation 301–323, 318–322
 - mixing 256
 - spinning drop method 65
 - thermodynamic definition 302–303
 - thermodynamic formation theory 307–310
 - Microfluidizer 272, 292
 - microscopic contact angle 373
 - microscopy 150–151
 - formulation evaluation 406–408
 - Mie regime 412
 - milling 206
 - bead 220, 393–394
 - schematic process 218
 - wet 125, 260–261, 392–394
 - miniemulsion polymerisation 256–257
 - minimum film-forming temperature (MFFT) 346–347
 - minisuspension polymerisation 256–257
 - mixed-film theories 303–305
 - mixed micelles 40–43
 - mixed surfactant films 199
 - mixed surfactants 334–335
 - mixed triglycerol trioleate 236
 - mixing
 - enthalpy of 48
 - microemulsions 256
 - mixing interaction 117–118
 - mixing repulsion 242
 - unfavorable 281
 - MMA (methyl methacrylate) 346
 - mobility, alkyl chains 31
 - model suspensions 446–448
 - model suspoemulsion 225–230
 - molecular motion 317
 - molecular structure 397
 - molecular weight 88
 - dispersion polymerisation 363
 - effect on diblocks 351
 - molecules
 - bulk/surface 253
 - orientation 172
 - moment of detachment 385
 - monodisperse suspensions 417
 - monomer initiation 362
 - monomer solubility 363
 - “monomer-swollen” micelles 346
 - monosaccharides, surfactants 23–24
 - monostearate, glyceryl 184
 - Monte Carlo methods 81–83
 - montmorillonite, sodium 102–103
 - multicomponent systems 308
 - multiple emulsions 3
 - breakdown 233–235
 - characterisation 247–248
 - formulation 231–249
 - stability 235–237
 - multipoint attachment 223, 390
 - myristate, isopropyl 235
- n**
- Na, *see* sodium
 - NAD, *see* nonaqueous dispersion polymerisation
 - NaDBS, *see* sodium dodecyl benzene sulfonate
 - Nakajima equation 292
 - nanocolloids 251
 - nanodispersions 119
 - nanoemulsions 4, 55
 - formulation 271–300
 - hydrocarbon oils 294
 - kinetic stability 282
 - nanosuspension preparation 255–256
 - polymeric surfactants 293–299
 - preparation 276–281

- nanoparticles
 - polymer 256–257
 - precipitation 254
- nanosuspensions 4
 - bottom-up processes 254–257
 - preparation 251–269
- naphthalene formaldehyde, sulfonated alkyl 53
- natural oils 296
- needles 368
- negative thixotropy 426–428
- Nernst equation 398
- net power density 276
- neutron scattering 89
- Newton black film 333
- Newtonian systems 424
- NMR measurements 316–317
- non-linear response 435
- non-Newtonian liquids, sedimentation 448
- nonadsorbed electrolyte 60
- nonaqueous dispersion (NAD) polymerisation 115, 207, 345, 360, 363–364
- nonelectrolytes 29
- nonionic polymers, dispersing agents 139
- nonionic surfactants 18–22
 - adsorption 72–74, 115–124
 - polymeric 92–98
- nonspecific adsorbed ions 104–105
- nonylphenol ethoxylate 278
- Nouy, *see* du Nouy's technique
- nucleation
 - and growth 126–127, 252–254
 - coagulative nucleation theory 346, 349
 - foam formulation 326
- number of configurations 266
- n*-octane 279
- o**
- octylhexaoxyethylene glycol monoether 37–38
- oil droplets, polyhedral 444
- oil-in-oil (O/O) emulsions 2
- oil-in-water-in-oil (O/W/O) emulsions 3, 231
- oil-in-water (O/W) emulsions 2
- oil-in-water (O/W) microemulsions 309–310
- oils
 - antifoaming oil lenses 336
 - carrier 217
 - conductivity 200
 - diffusion 197
 - emulsification 183
 - ethoxylated 21
 - external oil drops 233
 - inert 225
 - isoparaffinic 225–227
 - nanoemulsions 294
 - natural 296
 - separated oil phase 444
 - silicone 297
 - viscosity 200
- oil/water interface 58, 239
- “oily layer” 231
- αληα-olefin sulfonates 15
- oligomeric chains 362
- oligomers, adsorption isotherms 84
- opacifying white pigments 369
- opacity 367
- opaque phase 444
- optical microscopy 150–151
 - formulation evaluation 406–408
- optical properties, foams 341
- orientation, molecules 172
- oscillatory measurements 245
 - creaming prediction 451–452
 - flocculation assessment 454–456
 - formulation evaluation 423, 432–442
- oscillatory sweep 441, 455–456
- osmotic flow 234–235
- osmotic pressure 116
 - depletion flocculation 123
 - steric stabilisation 142
- osmotic repulsion 242
- Ostwald ripening 162, 196–197
 - assessment 405–410
 - ester-based nanoemulsions 298
 - flocculation assessment 453
 - measurements 420
 - nanoemulsions 272, 283–284
 - prevention 268
 - suspoemulsions 204
- Overbeek, *see* DLVO theory
- overlap
 - coil 448
 - electrical double layers 169
 - steric layers 213
- oxide surfaces 101–102
- p**
- paints, suspoemulsions 204–219
- partial wetting 370
- particles
 - clay 103
 - colloidal 133
 - growth 127, 254
 - hydrophobic 337–338
 - “inert” fine 157
 - liquid-like 1
 - particle–particle interactions 311

- preformed 128
- shape 368
- size distribution 392
- size distribution control 252–254
- suspensions 203–204
- partitioning, cosurfactants 322
- pendant drop method 64
- penetration, nanoemulsions 272
- PEO, *see* polyethylene oxide
- “permanent” foams 328
- permittivity 136
- phase angle shift 359
 - stress/strain 433
- phase-contrast microscopy 150
 - formulation evaluation 406–407
- phase diagrams
 - pseudoternary 285, 306
 - surfactants 33
 - three-component 305
- phase inversion 162–163
 - emulsions 200–201
- phase inversion composition (PIC) principle 272, 277
- phase inversion temperature (PIT) concept 186–187, 201
 - microemulsion characterisation 319–320
 - nanoemulsions 272, 277–279
- phase-separation model 35–36
- phase-transfer suspoemulsions 204
- phenol ethoxylates, alkyl 19–20
- phosphate-containing anionic surfactants 16
- photobleaching, FRAP 341
- photocount correlation function 314
- photon correlation spectroscopy (PCS) 91, 314–315, 415–418
- photosedimentation 404
- PHS (poly(hydroxystearic acid)) 236, 238–243
 - latexes 360–361
- physical chemistry
 - emulsion systems 164–172
 - surfactant solutions 27–44
- physical properties, foams 338–341
- pigments
 - coloured 205
 - dispersions 5, 205–206, 367–395
 - hydrophobic 379–380
 - opacifying white 369
- plastic systems, Bingham 425
- platelets 368
- Pluronics 78, 237
 - PEF127 244, 246–247
- PMMA, *see* poly(methylmethacrylate)
- point of zero charge (pzc) 101
- Poiseuille’s law 385–386
- polar head group 12
- polar media 364–365
- polar surfaces 71–72
- polarised light microscopy 150, 407
- polydecene 298
- polydispersity index 288, 417
- polyelectrolytes 53
 - dispersants 139, 390
- polyethylene oxide (PEO) 12
 - adsorbed layers 170
 - adsorption isotherms 93
 - grafted chains 227–230
 - hydrated layer 292
 - PHS-PEO-PHS block copolymer 238–242
 - PS-PEO block copolymers 349
 - synperonic PE 225–227
- polyfructose 293
- polyglucosides, alkyl 23–24
- polyhedral gas cells 327
- polyhedral oil droplets, distorted 444
- poly(hydroxystearic acid) (PHS) 236, 238–243
 - latexes 360–361
- polymers, nanoparticles 256–257
- polymeric surfactants 45–54
 - adsorption 77–99
 - dispersants 389
 - dispersion polymerisation 363
 - general classification 50–53
 - general description 237–238
 - latex stabilisation 356–360
 - nanoemulsions 293–299
 - nonionic 92–98
 - PIT concept 187
 - steric stabilisation 239–246
 - triblock 78
- polymerisation
 - dispersion 360–365
 - emulsion 207, 345–356
 - latexes 2, 345
 - miniemulsion/-suspension 256–257
 - NAD 115, 207, 345, 360, 363–364
 - precipitation 362
 - solution 362
- polymers
 - adsorption isotherms 84
 - adsorption kinetics 98
 - adsorption measurements 400–403
 - adsorption theories 80–87
 - layer overlap 117
 - nonionic 139

- polymers (*contd.*)
 - steric stabilisation 115–124
 - poly(methylmethacrylate) (PMMA) 211
 - backbone 215, 222–223
 - dispersants 389
 - latexes 350–352
 - poly(*p*-methylstyrene) (PMSt) 352–353
 - polysaccharides
 - foam films 329
 - graft copolymers 52
 - surfactants 23–24
 - polystyrene (PS) 349
 - dispersions 447
 - polystyrene (PS) latex 96, 225–230
 - aqueous 446–448
 - suspensions 155–156
 - poly(tetrafluoroethylene) (PTFE) 337
 - poly(vinyl alcohol) (PVA) 50, 79
 - adsorption isotherms 93
 - dispersants 390
 - post addition, INUTEC®SP1 355
 - powders
 - bulk 257–259
 - wetting 129–131, 370–387
 - precipitated silica 399
 - precipitation, nanoparticles 254
 - precipitation polymerisation 362
 - preformed latex dispersions 356–360
 - preformed particles 128
 - preparation
 - continuous/batch-wise 176, 275
 - foams 326
 - multiple emulsions 232
 - nanoemulsions 276–281
 - nanosuspensions 251–269
 - polymer nanoparticles 256–257
 - separate 224
 - suspensions 126
 - preservative, emulsions 450
 - pressure
 - disjoining 198, 331–334
 - Laplace 164, 177
 - Laplace capillary 331
 - maximum bubble pressure method 384–386
 - osmotic, *see* osmotic pressure
 - Princen–Kiss model 228–229
 - prolate ellipsoids 66
 - propionates, *N*-alkyl amino 18
 - protective colloids 360
 - PS, *see* polystyrene
 - pseudoplastic systems 425
 - pseudoternary phase diagram 285, 306
 - PTFE (poly(tetrafluoroethylene)) 337
 - pure liquids 325
 - PVA, *see* poly(vinyl alcohol)
 - pzc (point of zero charge) 101–102

q

 - quasi-crystalline lattice 83
 - quasi-elastic light scattering 91, 415
 - quaternary ammonium compounds 16

r

 - radius of gyration 47
 - random coil 47
 - random walk approach 80–81
 - rate of coalescence 200, 459–460
 - rate of flocculation, measurements 418–419
 - Rayleigh equation 418
 - Rayleigh-Gans-Debye (RGD) regime 411–412
 - rearrangement, micelles 383–384
 - reciprocal Debye length 261
 - recrystallisation, inhibition 225
 - redispersion 420–421
 - reduction, flocculation 196
 - reflection, selective 367
 - refractive index (RI) 367–369
 - “rejection anchoring” 237
 - relative supersaturation 127
 - relative viscosity 154
 - relaxation time 34, 225–226
 - flocculation assessment 456
 - oscillatory sweep measurements 441
 - repulsion
 - Born, *see* Born repulsion
 - electrostatic 167–170
 - lateral 59
 - mixing (osmotic) 242
 - steric, *see* steric repulsion
 - residual viscosity 432
 - creaming and sedimentation 446
 - resistance, electrical 316
 - restabilisation, clays 456–457
 - retardation time, Kelvin 431
 - reversible flocculation 147
 - rheological measurements 152
 - constant stress rheometer 437
 - multiple emulsions 248–249
 - rheological properties, foams 339
 - rheological techniques
 - creaming and sedimentation 445
 - emulsion coalescence 459–463
 - flocculation assessment 452–458
 - formulation evaluation 423–442
 - suspension stability 436–442

- rheology
 - concentrated suspensions 144
 - dispersions 213
 - emulsions 187
 - modifiers 224, 403
- RI (refractive index) 367–369
- Ricinus communis* 296
- Rideal–Washburn equation 130, 208
 - nanosuspensions 258
 - powder wetting 377
- rigidity modulus 435
- ring method, du Nouy's 64–65
- ripening, Ostwald, *see* Ostwald ripening
- rod-like micelles 32
- roughness, surfaces 373
- rupture, films 333–334
- rutile 367
- S**
- sample preparation
 - flocculation assessment 439, 454
 - optical microscopy 407
- saponification number 184
- saturation, interfaces 173
- saturation adsorption 59, 178
- Sauter mean 175
- Sauter radius 229
- scanning electron microscopy (SEM) 409
- scanning probe microscopy (SPM) 409–410
- scanning tunneling microscopy (STM) 410
- scattering techniques
 - formulation evaluation 411–418
 - microemulsion characterisation 311–315
 - stability assessment 151–152
- scattering vector 274–275, 311, 314–315, 417
- Scheutjens–Fleer (SF) theory 82, 85–87
- Schultze–Hardy rule 134, 195
- SDS, *see* sodium dodecyl sulphate
- second law of thermodynamics 48, 57, 303
 - emulsion formation 165, 172
- second-order autocorrelation function 416
- sedimentation 153–156
 - assessment 403–405, 436–437, 443–452
 - emulsion formulation 161–162
 - emulsions 187–192
 - non-Newtonian liquids 448
 - prevention 156–158
 - suspoemulsions 221
 - velocity 154
- sedimentation method 90
- sediments, compact 125, 147
- seeds 254
 - emulsion polymerisation 348
- segment density–distance distribution 82
- segments, fraction of 89
- selection of dispersants 391–394
- selection of emulsifiers 183–187
- selective absorption and reflection 367
- self-association, surfactants 30
- self-diffusion 317
- self-emulsification 279
- SEM (scanning electron microscopy) 409
- semi-dilute region 448
- separate preparation 224
- separated oil phase 444
- separation, formulations 445–446
- SF (Scheutjens–Fleer) theory 82, 85–87
- shampoos 22
- shear modulus 228
- shear rate, viscosity–shear rate relationship 424
- shear stress, measurements 423
- shear thinning/thickening systems 425
- shelf life, multiple emulsions 231, 234
- shrinking, droplets 234
- side-chain length 352–353
- silica, precipitated 399
- silica particles 337
- silicone oils 297
- silicone surfactants 22–23
- single surfactants 308–309
- sinking time 377–378
- size distribution
 - control 252–254
 - particles 392
- Slesov, *see* Lifshitz–Slesov–Wagner theory
- “slip” 438
- wall 452
- Smoluchowski, *see* von Smoluchowski ...
- soaps 13
- sodium dodecyl benzene sulfonate (NaDBS) 312–313
 - powder wetting 380
- sodium dodecyl sulphate (SDS) 15
 - benzene 178
 - carbon black surfaces 70
 - cmc 30
 - dilational modulus 180
 - dilution of microemulsions 280
 - surfactant mixtures 41
- sodium montmorillonite 102–103
- solid/liquid dispersions, *see* suspensions
- solid/liquid interface 66–74
 - adsorption of polymeric surfactants 77–99
 - structure 398–403
 - suspension preparation 131–141
- solids
 - elastic 430

- solids (*contd.*)
 - insoluble 1
 - loading 214
 - viscoelastic 431
- solubility
 - monomers 363–364
 - temperature dependence 33
- solubilisation theories 305–307
- solubilised chemicals, antifoaming 335–336
- solution polymerisation 362
- solution properties
 - copolymers 50
 - polymeric surfactants 46–50
- solutions
 - metastable (supersaturated) 126–127
 - micellar 301
- solvency 48, 88
 - reduction 122, 144
- solvent–antisolvent method 255
- solvents, athermal 86
- sorbitan esters 20–21
- sorbitan trioleate 236
- Spans 20–21
- specialty surfactants 22
- specific adsorbed ions 104–105
- spheres 368
 - hard-sphere dispersions 240, 312
- spherical foam 327
- spherical micelles 28, 32
- Spheron 70
- spinning drop method 65–66
- SPM (scanning probe microscopy) 409–410
- spontaneous electromagnetic fluctuations 108
- spontaneous emulsification, spinning drop method 65
- spontaneous formation 307
- spreading
 - nanoemulsions 272
 - oil droplets 337
 - spreading coefficient 372
 - spreading wetting 377
- squalane 290–291, 296
- stability
 - assessment 149
 - colloids, *see* DLVO theory
 - disperse systems 115–124
 - foams 328–335
 - kinetic 282
 - multiple emulsions 235–237
 - suspensions 436–442
 - thermodynamic 119, 266
- stabilisation
 - by micelles 334
 - dispersions 113, 261–267
 - electrostatic 193–195
 - emulsions 55
 - energy-distance curves 211
 - lamellar liquid crystalline phases 334
 - mixed surfactants 334–335
 - preformed latex dispersions 356–360
 - steric, *see* steric stabilisation
- stabilised emulsions, electrostatically 113
- stabilisers, emulsion polymerisation 349–356
- stabilising chains 45, 360
- standard chemical potential 35–36
- static light scattering 311–313
- statistical mechanical approach, polymer adsorption 80–81
- steady-state measurements 248, 423–428
 - flocculation assessment 452–453
- stearate 216
- stearyl ether 298
- step change, thixotropy measurements 428
- stepwise aggregation, micelles 383–384
- steric layers, overlap 213
- steric potential 212
- steric repulsion 45, 170–172
 - nanosuspensions 264
- steric stabilisation
 - adsorbed layer thickness 281
 - adsorbed polymeric surfactants 239–246
 - effective 120–121
 - emulsions 171, 195–196
 - energy-distance curves 211
 - polymers 115–124
 - suspensions 141–143
 - suspoemulsions 210
- sterically stabilised dispersions, flocculation 457–458
- sterically stabilised emulsions, flocculation 458
- Stern–Grahame model 104
- Stern–Langmuir equation 140
- Stern–Langmuir isotherm 68
- Stern plane 92, 168
- stiffness “persistence” 47
- stirrers, high-speed 273
- STM (scanning tunneling microscopy) 410
- Stokes–Einstein equation 91, 193
 - dynamic light scattering 315
 - flocculation 111
 - nanoemulsions 275
 - PCS 417
- Stokes’ law 153
- stopped-flow methods 35

- storage modulus 225–226
 - formulation evaluation 433–436
 - latexes 359
 - time dependence 461
- strain
 - critical 435, 463
 - phase angle shift 433
- strain sweep 434, 440–441, 454–455
- stress, phase angle shift 433
- structural parameters, foams 342
- “structured” suspensions 420
- “structured” water 39
- “structuring” agents 441
- styrene 346
- subcritical supersaturation 254
- submersion test 377–378
- substitution, isomorphous 102–103
- sugar surfactants 23–24
- sulphates 14–15
 - dodecyl 28
- sulfonated alkyl naphthalene formaldehyde 53
- sulfonates 15–16
- sulfosuccinates 16
 - diethylhexyl, *see* Aerosol OT
- sulfoxide, alkyl 38
- sunscreens 207–219
- supersaturation 253–254
 - foam formulation 326
 - subcritical 254
 - supersaturated solutions 126–127
- surface-active agents, *see* surfactants
- surface-active material 325
- surface charge, measurements 398
- surface diffusion 382
- surface dilational modulus 330
- surface energy 372
- surface excess 57–58
- surface fluctuations 198
- surface forces, theory 331–334
- surface ions 101–102
- surface lifetime 387
- surface molecules 253
- surface potential 398
- surface tension 27, 37–38
 - Gibbs–Duhem equation 57
 - gradients 336–337
 - powder wetting 374
- surface viscosity 330
- surfaces
 - carbon black 70
 - conformations of macromolecules 78
 - hydrophobic 68–71
 - oxide 101–102
 - polar 71–72
 - roughness 373
- surfactants
 - adsorption 55–75, 139–141, 172–183
 - adsorption measurements 400–403
 - amphoteric 17–18
 - anionic 13–16, 42–43, 347
 - cationic, *see* cationic surfactants
 - cmc 29–30
 - co-, *see* cosurfactants
 - combined 308–309
 - dispersants 139, 388
 - dispersion formulation 11–25
 - droplet deformation 179–183
 - effect on powder wetting 374–375
 - emulsification methods 275
 - emulsion formation 177–178
 - emulsion polymerisation 347
 - general classification 12–24
 - Gibbs–Marangoni effect 332
 - ionic 68–71
 - mixed 40–43, 334–335
 - mixed films 199
 - molecule orientation 172
 - nonionic, *see* nonionic surfactants
 - physical chemistry 27–44
 - polymeric, *see* polymeric surfactants
 - self-association 30
 - single 308–309
 - solutions 378–379
 - specialty 22
 - three-component phase diagram 305
- suspension polymerisation 207
 - latexes 345
- suspensions 1–2
 - bulk properties 152–158, 397
 - characterisation 149, 397
 - coagulated 146
 - coarse 146
 - concentrated 144–149
 - flocculation 111–113
 - formulation 125–160
 - mini-, *see* minisuspension
 - model 446–448
 - monodisperse 417
 - nano-, *see* nanosuspensions
 - particles 203–204
 - preparation 126
 - PS latex 155–156
 - sedimentation assessment 403–405
 - stability 436–442
 - state 397
 - steric stabilisation 141–143
 - “structured” 420

- suspoemulsions 3
 - formulation 203–230
 - in agrochemicals 219–230
 - model 225–230
 - “swollen” micelles 301
 - syneresis 445–446
 - assessment 436–437
 - synperonic PE 225–227
 - Szyszkowski equation 62–63
 - *see also* Langmuir–Szyszkowski equation
 - “tails” 77–78, 81–83
 - dangling 294
 - SF theory 87
- t**
 - Teller, *see* Brunauer–Emmett–Teller equation
 - TEM (transmission electron microscopy) 408–409
 - temperature
 - CFT 122, 144, 359–360, 364
 - glass transition 204–205
 - HLB- 278–279, 286–288
 - Krafft 32–33, 35
 - MFFT 346–347
 - PIT concept, *see* phase inversion temperature
 - temperature dependence
 - adsorption 94
 - cmc 30, 33
 - conductivity 286, 320
 - interfacial tension 320
 - temperature sweep experiments 438
 - tension
 - adhesion 372
 - gradients 179
 - interfacial, *see* interfacial tension
 - measurements 63–66
 - surface, *see* surface tension
 - thermal motion 145
 - thermodynamic definition, microemulsions 302–303
 - thermodynamic formation theory, microemulsions 307–310
 - thermodynamic stability 119, 266
 - thermodynamics
 - emulsion formation 165–166
 - micellisation 33–37
 - second law, *see* second law of thermodynamics
 - thickeners 403
 - flow behaviour 448
 - high-molecular-weight 157
 - multiple emulsions 236
 - suspension stability 437–438
 - xanthan gum 450
 - thickness
 - adsorbed layers 89–92, 281
 - fluctuations 333
 - hydrodynamic 93–94, 115–116
 - thinning
 - foam films 329
 - shear thinning systems 425, 427
 - thixotropy 148, 426–428
 - three-component phase diagram 305
 - “three-dimensional” gel network 222
 - time-average light scattering 311–313, 411–412
 - titanium dioxide 367
 - dispersions 216
 - top-down processes 4
 - nanosuspensions 251, 257–259
 - tortuosity factor 209
 - “trains” 77–78, 81
 - SF theory 87
 - transacetalisation 24
 - transfer of hydrocarbons 39
 - transient foams 328
 - translational diffusion coefficient 274
 - transmission electron microscopy (TEM) 408–409
 - transparency
 - microemulsions 301
 - nanoemulsions 271–272
 - Traube’s rule 68
 - triblock 50–51
 - triblock polymeric surfactants 78
 - tridemorph 220–222
 - trifunctional products 51
 - triglycerol trioleate, mixed 236
 - trioleate
 - mixed triglycerol 236
 - sorbitan 236
 - turbidity 30, 36
 - measurements 152, 412–413
 - suspensions 404, 420
 - Turboscan 404
 - turbulent eddies 176
 - turtuosity factor 258, 377
 - Tweens 20–21
 - two-dimensional gas 61
 - two-dimensional van der Waals equation 61
- u**
 - ultramicroscopy 137–138
 - flow 419
 - ultrasonic generator 182
 - unstable foams 328
 - UV attenuation 216–217

v

- van der Waals attraction 45, 132
 - electrical double layers 106–109
 - emulsion droplets 166–167
- van der Waals energy 243, 261
- van der Waals equation, two-dimensional 61
- vaporisation, heat of 321
- vector analysis, complex modulus 434–436
- velocity, sedimentation 154
- vertical films 329
- vertical mills 394
- Verwey, *see* DLVO theory
- viscoelastic films 244
- viscoelastic response 429, 433
- viscosity 136, 148
 - dynamic 225–226, 434
 - measurements 460–461
 - oils 200
 - relative 154
 - residual 432, 446
 - shear thinning systems 427
 - solids loading 214
 - surface 330
 - variable 339
 - viscosity–shear rate relationship 424
 - water 153
 - zero shear 218, 432
- viscosity method 90
- viscosity ratio 182
- viscous flow 245
- viscous modulus 225–226
 - formulation evaluation 433–436
 - latexes 359
- viscous response 429, 432
- volume fraction, effective 213
- von Smoluchowski equation, foams 340
- von Smoluchowski–Fuchs theory 418
- von Smoluchowski rate 193
- von Smoluchowski treatment 136–137

w

- Waals, *see* van der Waals
- Wagner, *see* Lifshitz–Slesov–Wagner theory
- wall slip 452
- Washburn, *see* Rideal–Washburn equation
- water
 - osmotic flow 234–235
 - static light scattering 312–313
 - “structured” 39
 - three-component phase diagram 305

- water-in-oil-in-water (W/O/W) emulsions 3, 231
- water-in-oil (W/O) emulsions 2
- water-in-oil (W/O) microemulsions 309–310
- water-soluble marker 232
- weak flocculation 121, 143, 145–147, 455
- Weber number 177, 275
- wet foams 339
- wet milling 125, 260–261
 - deagglomeration 392–394
- “wettability” 373–374
 - measurements 377–378
- wetting
 - agents 210, 379–380
 - bulk powder 257–259
 - dynamics of processing 380–384
 - nanoemulsions 272
 - powders 129–131, 370–387
 - wetting line 208, 371
- white pigments, opacifying 369
- Wilhelmy plate method 63–64
- Williams, *see* Brag–Williams approximation

x

- X-ray sedimentation 404
- xanthan gum 154
 - Keltrol 246–247
 - thickener 450
- xylylene 312–313

y

- yield, multiple emulsions 232
- yield stress 356
 - “true” 432
- yield value, measurement 461
- Young’s equation 129
 - nanosuspensions 257
 - wetting line 208–209, 371–372

z

- zero shear viscosity 218, 432
- zeta potential (ζ)
 - calculation 136–137
 - electrokinetic phenomena 135
 - foams 340
 - measurements 71–72, 137–138, 399
- zwitterionic surfactants 17–18
 - emulsion polymerisation 347

