

Index

a

AcoustoSizer cell 79
 adhesion
 – tension 20–22
 – work of 22
 adsorption
 – adsorbate–adsorbent interaction 100
 – adsorbed layer thickness 119–122, 126–128
 – dynamic processes 34–42
 – energy 109
 – Gibbs equation 5, 33
 – isotherm, *see* isotherm
 – kinetics 34–42, 128
 – measurements 196–199
 – (non)specific adsorbed ions 52–53
 – polymeric surfactants 107–129, 131–136
 – polymers 110–117
 – relative 3
 – surfactants 33–34, 93–103
 – temperature effects 104
 advancing angle 26
 Aerosol OT 46
 AFM (atomic force microscopy) 206
 agents
 – dispersing 2, 85–105
 – wetting 45–46
 aggregation
 – aggregate/agglomerate breaking 8
 – configurational entropy 167
 – diffusion-controlled 254
 – rapid/slow 260
 air/solution interface 103
 alcohol ethoxylates 87–88
 alkyl–alkyl interaction 101
 alkyl naphthalene formaldehyde condensates 93
 alkyl phenol ethoxylates 88
 alumina substrates 98

amine ethoxylates 90
 amphoteric surfactants 86–87
 analysis of creep curves 226
 analysis of flow curves 220–223, 258–259
 anchor 125–127
 angle, contact 18–20, 23–28
 anionic surfactants 85–86
 antithixotropy 223–225
 aqueous clay dispersions 181
 aqueous media 179
 assessment
 – flocculation 201–206
 – sedimentation 199–201
 – stability, *see* stability assessment
 athermal solvent 115
 Atlox 4913 147
 atom arrangement 180
 atomic force microscopy (AFM) 206
 autocorrelation function 212

b

backscattering techniques 214
 balance of density 178
 Batchelor equation 244
 benzyl alcohol 151
 Bingham plastic systems 221
 Bingham yield value 251, 254, 264
 block copolymers 108, 124
 bonding, hydrogen 139
 Born repulsion 57
 Bragg–Williams approximation 112
 breaking, aggregates/agglomerates 8
 bridging flocculation 138–141, 165
 Brownian diffusion 160, 166
 – concentrated suspensions 243–245
 – energy 171
 Brownian motion 121
 bubble pressure 39–42
 bulk properties, suspensions 216

- Bulkley, Herschel–Bulkley equation 222
- buoy 125–127
- c**
 - calculation
 - contact angle 23–25
 - surface tension 23–25
 - zeta potential 68–73
 - capillary flow 40
 - capture distance 152
 - carbon substrates 96
 - carboxylates 86
 - Casson model 222
 - cationic polyelectrolytes 141
 - cationic surfactants 86, 240
 - cell
 - AcoustoSizer 79
 - cylindrical electrophoretic 74
 - cellulose
 - EHEC 176–177
 - hydroxyethyl 11, 190
 - cetyl trimethyl ammonium bromide (CTAB) 240
 - CFC (critical flocculation concentration) 263–264, 268–269
 - CFT (critical flocculation temperature) 215, 241
 - CFV (critical volume fraction) 138
 - characterization, suspensions 193–217
 - charge
 - accumulation 64
 - density 194
 - separation 64
 - surface 49–51, 194–195
 - chemical potential 256
 - solvents 133
 - claying 191
 - clays 10–11, 51
 - aqueous dispersions 181
 - restabilization 240
 - close-packed hemimicelles 101
 - CLSM (confocal laser scanning microscopy) 205
 - coagulation 156, 165
 - electrolytes 261–263
 - suspensions 258, 261–263
 - coalescence 236–237
 - coarse suspensions 165
 - cohesion, work of 22–23
 - cohesive energy density 232–233
 - colloidal dispersions 162, 165
 - colloidal vibration potential (CVP) 79
 - comminution 8–9
 - compact sediments 10–11
 - complete wetting 19
 - complex modulus 230–231
 - compression
 - liquids 35
 - particles 132
 - concentrated suspensions 12, 151–169
 - rheology 243–270
 - concentration
 - CFC 263–264, 268–269
 - cmc 87, 97–102
 - electrolytes 157–158, 185
 - particles 171
 - range 11–12, 82
 - surfactants 2
 - condensation methods 142
 - configurational entropy 109, 134, 154–155
 - particle aggregation 167
 - confocal laser scanning microscopy (CLSM) 205
 - conformation, polymeric surfactants 107–129
 - constant stress measurements 176, 219, 225–229
 - contact angle 18–20
 - calculation 23–25
 - hysteresis 26–28
 - measurement 44–45
 - water drops 18
 - controlled flocculation 183–186
 - copolymers 142–148
 - block 108, 124
 - diblock 125–127
 - graft 124
 - counterions, valency 152
 - coverage, surface 116
 - creaming 234
 - creep curves, analysis 226
 - creep measurements 176, 219, 225–229
 - critical flocculation concentration (CFC) 263–264, 268–269
 - critical flocculation temperature (CFT) 215, 241
 - critical micelle concentration (cmc) 87, 97–102
 - critical surface tension 31–47
 - critical volume fraction (CFV) 138
 - Cross equation 222–223
 - crystal growth 9–10, 201–206
 - measurement 216
 - CTAB (cetyl trimethyl ammonium bromide) 240
 - cumulant method 213
 - CVP (colloidal vibration potential) 79
 - cylindrical electrophoretic cell 74

d

Deborah number 243
 Debye, RGD regime 207–208
 Debye–Hückel parameter 66–67
 decay constant 212
 density
 – balance 178
 – charge 194
 – cohesive energy 232–233
 – segment density distribution 111–112, 119–122
 depletion flocculation 138, 165–168
 – free energy 255
 – osmotic pressure 168
 – sedimentation 186–190
 depth of immersion 27
 Deryaguin–Landau–Verwey–Overbeek theory 57–59, 157, 183–184
 desorption flux 35
 destabilization, suspensions 131–149
 Deuhem, Gibbs–Deuhem equation 3
 deuterated polystyrene latex 126–127
 dewetting 27
 diblock copolymers 125–127
 diethylhexyl sulphosuccinate 46
 differential interference contrast 202–203
 diffraction techniques, light 208–210
 diffuse double layer 51–52
 diffusion
 – Brownian 160, 166, 171, 243–245
 – diffusion-controlled aggregation 254
 – Stokes–Einstein equation 60
 – translational coefficient 212
 dilatant sediments 278
 dilatant systems 222
 dilation, liquids 35
 dilute region 114
 dilute solutions 175
 dilute suspensions 12, 160–164
 dispersing agents 2, 85–105
 dispersion constant, London 23, 54, 156
 dispersion methods 142
 dispersion polymerization 142
 dispersions
 – colloidal 162, 165
 – microstructure 160
 – NAD 142
 – polystyrene 174
 – polystyrene latex 164, 247–248
 – powders 1–11
 – preformed latex 146–148
 – stabilization 9
 – steric stabilization 136–138, 240–241, 248–250

distance

– atoms 180
 – capture 152
 – energy–distance curves 135–137, 158–159, 184
 – force–separation distance curves 144–145
 distribution function, radial 161
 divided particulate solids 182–183
 DLVO theory 57–59, 157, 183–184
 Doppler shift 78
 dorn effect 65
 double layer
 – characterization 194–196
 – double-layer interaction 53
 – double-layer overlap 181
 – electrical 51–54, 67–68
 – thickness 67
 doublet floc structure model 267–268
 Dougherty–Krieger equation 173, 246–248
 drop profile 27–28
 drop volume technique 38–39
 dynamic adsorption and wetting processes 34–42
 dynamic light scattering 211–214
 dynamic mobility 80
 dynamic (oscillatory) measurements 220, 229–241
 dynamic viscosity 230–231

e

edge-to-face association 181
 effective Hamaker constant 55–56
 effective steric stabilization 135–136
 EHEC (ethyl(hydroxyethyl) cellulose) 176–177
 Einstein
 – Einstein equation 120, 244
 – Stokes–Einstein equation 60, 77, 121
 elastic floc model 259, 268–269
 elastic interaction 134–135
 elastic modulus 260
 elastic response 151, 225
 electroosmotic velocity 69
 electrical double layer 51–54, 67–68
 – repulsion 53–54
 electroacoustic methods 78
 electrokinetic phenomena 63–83
 – measurements 195–196
 electrolytes 54, 59
 – coagulation 261–263
 – concentration 157–158, 185
 – electroacoustic potential 82
 electron microscopy 204–205

- electroosmosis 64–65
- electrophoresis 64
 - cylindrical cell 74
 - electrophoretic mobility 73–78, 121, 240
- electrostatic interaction 152–153, 246–248
 - electrostatic-patch model 141
- electrostatic stabilization 49–62
 - emulsions 61
 - suspensions 184, 261–263
- ellipsometry 119
- emulsion polymerization 142
- energy
 - adsorption 109
 - Brownian diffusion 171
 - cohesive 232–233
 - energy–distance curves 135–137, 158–159, 184
 - free 186, 255
- entropy, configurational 109, 134, 154–155, 167
- equilibrium sediment volume/height 216–217
- esters, sorbitan 89–90
- ethoxylated fats and oils 90
- ethyl(hydroxyethyl) cellulose (EHEC) 176–177
- experimental techniques
 - adsorption kinetics 37–42
 - polymeric surfactant adsorption 117–118

f

- fatty acid ethoxylates 88
- fine particles, “inert” 179–182
- finely divided particulate solids 182–183
- flocculation 59–62, 165
 - assessment 201–206
 - bridging 138–141, 165
 - CFC 263–264, 268–269
 - clays 240
 - concentrated suspensions 245
 - controlled 183–186
 - critical flocculation temperature 215, 241
 - depletion 186–190
 - doublet floc structure model 267–268
 - elastic floc model 259, 268–269
 - flocculated suspension rheology 250–258
 - fractal concept 259–260
 - free energy 186
 - rate measurements 214–215
 - rheological measurements 235–241
 - sterically stabilized dispersions 136–138, 240–241
 - temperature effect 266–267
- Flory–Huggins interaction parameter 113, 132, 154–155

flow

- capillary 40
- flow curve analysis 220–223, 258–259
 - Marangoni 35
 - pseudoplastic flow curve 258
 - thixotropy 223–225
- fluids
 - “fluid-like” behavior 151
 - Newtonian 221
 - non-Newtonian 173
- force
 - force–separation distance curves 144–145
 - gravity 172
 - hydrodynamic 68, 172
 - van der Waals 8, 23, 267
- Fowkes treatment 25
- fractal flocculation concept 259–260
- fraction of segments 118–119
- Fraunhofer theory 209–210
- free energy 186, 255
- free polymers 252–253
- frequency sweep 231
- friction, hydrodynamic 82
- Frumkin–Fowler–Guggenheim equation 95

g

- Gans, RGD regime 207–208
- gels 179
- general scaling law 257
- Gibbs adsorption equation 5, 33
- Gibbs–Deuhem equation 3
- “girders” 259
- glass 31
 - hydrophobized surfaces 145
- glycerol 91
- goethite 195–196
- Good and Girifalco approach 24–25
- graft copolymers 124
- Grahame, Stern–Grahame model 52, 67–68
- graphitization 97
- gravity force 172
- gum, xanthan 11
- gyration, radius 168, 256

h

- Hamaker constant 23, 156
 - effective 55–56
- hard-sphere interaction 151–152
- hard-sphere suspensions 244
- head group, hydrophilic 4
- HEC (hydroxyethyl cellulose) 11, 190

- height, sediment 185, 216–217
- hemimicelles, close-packed 101
- Henry region, linear 115
- Henry's treatment 72–73
- Herschel–Bulkley equation 222
- hexagonal packing 121
- high-affinity isotherm 199
- high-energy solids 31
- high-frequency shear modulus 164
- high molecular weight, thickeners 178–179
- HLB (hydrophilic-lipophilic-balance) 99
- homopolymer sequence 108
- Hückel equation 71–72
 - Debye–Hückel parameter 66–67
- Huggins, Flory–Huggins interaction parameter 113, 132, 154–155
- hydrodynamic force 68, 172
- hydrodynamic friction 82
- hydrodynamic thickness 127, 131
- hydrogen bonding 139
- hydrophilic head group 4
- hydrophilic-lipophilic-balance (HLB) 99
- hydrophobic powders 1
- hydrophobic solids 45–46, 103–104
- hydrophobic surfaces 94–97
- hydrophobically modified inulin copolymers 142–146
- hydrophobized glass surfaces 145
- hydroxyethyl cellulose (HEC) 11, 190
- hypermers 146–147
- i**
 - immersion
 - depth of 27
 - solids 21
 - test 45
 - impulse theory 258–259
 - incipient flocculation 137–138
 - measurement 215–216
 - incomplete wetting 19
 - “inert” fine particles 179–182
 - insulin backbone 93
 - intensity fluctuation 76, 211
 - interaction
 - adsorbate–adsorbent 100
 - alkyl–alkyl 101
 - double-layer 53
 - elastic 134–135
 - electrostatic 152–153, 246–248
 - Flory–Huggins 113, 132, 154–155
 - hard-sphere 151–152
 - interparticle 151–159
 - mixing 132–134
 - soft 152–153, 244
 - steric 131–136, 153–156
 - van der Waals, *see* van der Waals forces
 - interfaces
 - air/solution 103
 - charge accumulation 64
 - solid/liquid 49–62, 93–103, 107–129, 194–199
 - interference contrast, differential 202–203
 - interpenetration 132
 - INUTEC® 92, 142–146
 - ionic surfactants 5, 94–98
 - ionic vibration potential (IVP) 78–79
 - ions
 - adsorbed 52–53
 - surface 49–50
 - isoelectric point 98
 - isomorphic substitution 50–51
 - isotherm 103–104
 - high affinity 199
 - Langmuir-type 6, 197
 - measurement 118
 - nonionic polymeric surfactants 122–126
 - Stern–Langmuir 94
- j**
 - Jones, Lennard–Jones equation 24
- k**
 - Kelvin equation 216
- kinetics
 - adsorption 34–42
 - flocculation 59–60
 - micellar 37–38
 - polymer adsorption 128
- Krieger
 - Dougherty–Krieger equation 173, 246–248
 - Krieger equation 269
- l**
 - Landau, Deryaguin–Landau–Verwey–Overbeek theory 57–59, 157, 183–184
 - Langmuir
 - Langmuir-type adsorption isotherm 6, 197
 - Stern–Langmuir equation 6–7
 - Stern–Langmuir isotherm 94
 - Laplace transform 213
 - laser scanning microscopy, confocal 205
 - laser velocimetry 76–78
 - latex
 - deuterated polystyrene 126–127
 - polystyrene latex sediments 187
 - preformed dispersions 146–148

- lattice
 - quasicrystalline 113
 - standard 210
- laws and equations
 - Batchelor equation 244
 - Cross equation 222–223
 - Debye–Hückel parameter 66–67
 - Dougherty–Krieger equation 173, 246
 - dynamic viscosity 230–231
 - Einstein equation 120, 244
 - Frumkin–Fowler–Guggenheim equation 95
 - general scaling law 257
 - Gibbs adsorption equation 5, 33
 - Gibbs–Deuhem equation 3
 - Herschel–Bulkley equation 222
 - Hückel equation 71–72
 - Kelvin equation 216
 - Krieger equation 269
 - Lennard–Jones equation 24
 - Nernst equation 194
 - Ohm’s law 70
 - osmotic pressure 163
 - particle concentration 171
 - photocount correlation function 77
 - Poiseuille’s law 41
 - Poisson’s equation 69
 - Rideal–Washburn equation 43–44
 - shear stress 176
 - Stern–Langmuir equation 6–7
 - Stokes–Einstein equation 60, 77, 121
 - Stokes’ law 172
 - Wenzel’s equation 28–29
 - Young’s equation 19–20
- layer overlap 133
- Lennard–Jones equation 24
- light diffraction techniques 208–210
- light scattering techniques 76, 207–208
- linear Henry region 115
- liquid crystalline phases 190–191
- liquids
 - compression/dilation 35
 - contact angle measurement 44–45
 - effective Hamaker constant 56
 - Rideal–Washburn equation 43–44
 - solid/liquid interface 49–62, 93–103, 107–129, 194–199
 - supernatant 73
 - surface spreading 25–26
 - viscoelastic 226
 - viscosity 65–66
- log W –log C curve 61
- London dispersion constant 23, 54, 156
- loops 108, 117
- loss modulus 266
- low-energy solids 31
- m**
 - macromolecules 108
 - macromonomers 146
 - Marangoni flow 35
 - maximum bubble pressure technique 39–42
 - Maxwell relaxation time 230
 - mean-field approximation 112
 - measurements 37–42, 117–118
 - adsorption isotherm 118
 - adsorption kinetics 37–42
 - constant stress 176, 219, 225–229
 - contact angle 44–45
 - dynamic (oscillatory) 220, 229–241
 - electrokinetic 195–196
 - electrophoretic mobility 73–78
 - flocculation rate 214–215
 - incipient flocculation 215–216
 - particle size 203
 - rheological 188, 219–241
 - steady-state 220–225
 - surfactant/polymer adsorption 196–199
 - turbidity 208
 - *see also* assessment, experimental techniques
 - methods and techniques 21
 - cumulant method 213
 - electroacoustic 78
 - Fowkes treatment 25
 - Good and Girifalco approach 24–25
 - Henry’s treatment 72–73
 - Monte Carlo 111
 - random walk approach 110
 - scattering techniques 206–214
 - sedimentation method 121
 - viscosity method 121
 - von Smoluchowski treatment 68–71
 - micellar solutions 36–37
 - microelectrophoresis 73–76
 - microscopy
 - electron 204–205
 - optical 201–203
 - ultramicroscopic technique 73–76, 202
 - microstructure, dispersion 160
 - Mie regime 208
 - milling, wet 8–9
 - mixing interaction 132–134
 - mixtures of polymers 182–183

- mobility
 - dynamic 80
 - electrophoretic 73–78, 121, 240
 - particle 68–73
- model nonionic surfactants 103–104
- modulus
 - complex 230–231
 - elastic 260
 - high-frequency shear 164
 - loss 266
 - storage 257, 266
- molecular weight 178–179
- Monte Carlo method 111
- montmorillonite, sodium 179, 182
- n**
 - Na, *see* sodium
 - negative thixotropy 223–225
 - Nernst equation 194
 - network, three-dimensional 250
 - (non-)Newtonian fluids 173, 220–221
 - nonabsorbing particles 208
 - nonaqueous dispersion polymerization (NAD) 142
 - nonionic surfactants 87, 98–101
 - model 103–104
 - polymeric 122–126
 - nonspecific adsorbed ions 52–53
- o**
 - Ohm's law 70
 - oils, ethoxylated 90
 - oligomers, dilute region 114
 - optical microscopy 201–203
 - oscillatory measurements 220, 229–241
 - oscillatory sweep 232, 239–240
 - osmotic pressure 139, 163
 - depletion flocculation 168
 - Ostwald ripening 9–10, 201–206
 - measurement 216, 236–237
 - Overbeek, Deryaguin–Landau–Verwey–Overbeek theory 57–59, 157, 183–184
 - overlap 133, 181
 - oxide surface 49–50
- p**
 - pair distribution function 161–162
 - partial wetting 19
 - particles
 - aggregation 167
 - concentration 82, 171
 - dimensions 11
 - “inert” fine 179–182
 - mobility 68–73
 - nonabsorbing 208
 - size 178, 203
 - spherical 153
 - steric stabilization 131–136
 - particulate solids 182–183
 - Péclet number 243
 - penetration, rate of 43–44
 - PEO (poly(ethylene oxide)) 91, 99, 108, 122–123
 - sedimentation 188–190
 - stability assessment 198
 - permittivity 81, 152
 - phase contrast 202
 - phosphates 86, 191
 - photocount correlation function 77
 - photon correlation spectroscopy (PCS) 211–214
 - plate technique, Wilhelmy 21
 - Poiseuille's law 41
 - Poisson's equation 69
 - polar surfaces 97–98
 - polarized light microscopy 203
 - polydisperse suspensions 213, 247
 - polyelectrolytes 138–141
 - cationic 141
 - poly(ethylene oxide) (PEO) 91, 99, 108, 122–123
 - sedimentation 188–190
 - stability assessment 198
 - polyethylene terephthalate 31
 - polyfructose 143
 - polymeric surfactants 90–93
 - adsorption isotherm 122–126
 - conformation 107–129
 - nonionic 122–126
 - steric stabilization 131–149
 - polymerization 142
 - polymers
 - adsorption 110–117, 128, 196–199
 - bridging flocculation 138–141
 - dilute region 114
 - free 252–253
 - layer overlap 133
 - polystyrene dispersions 174
 - polystyrene latex
 - deuterated 126–127
 - dispersions 164, 247–248
 - sediments 187
 - polystyrene latex suspensions, coagulated 262–263
 - polytetrafluoroethylene (PTFE) 31–32

poly(vinyl alcohol) (PVA) 107, 123–124
 – sedimentation 186
 porous substrates 17
 powders
 – contact angle measurement 44–45
 – dispersion 1–11
 – hydrophobic 1
 – spreading 17–29
 – wettability 45
 – wetting, *see* wetting
 power law plot 254
 precipitated silica 194–195
 preformed latex dispersions 146–148
 pressure
 – bubble 39–42
 – osmotic 139, 163, 168
 pseudoplastic flow curve 258
 pseudoplastic systems 221
 PTFE (polytetrafluoroethylene) 31–32
 PVA (poly(vinyl alcohol)) 107, 123–124
 – sedimentation 186
 pzc value 50

q

quasicrystalline lattice 113

r

radial distribution function 161
 radius of gyration 168, 256
 random walk approach 110
 rapid aggregation 260
 rate of penetration 43–44
 Rayleigh regime 207–208
 receding angle 26
 redispersion 216–217
 – sediment 185
 relative adsorption 3
 relative viscosity 246
 relaxation time 239
 – Maxwell 230
 residual viscosity 228, 234
 restabilization 140
 – clays 240
 reversible time dependence, viscosity 179
 rheological measurements 188, 219–241
 rheology, concentrated suspensions 243–270
 Rideal–Washburn equation 43–44
 ripening, Ostwald 9–10, 201–206, 216, 236–237
 rough surfaces 28

s

sample preparation, optical microscopy 203
 scaling law 257

scanning electron microscopy (SEM) 204–205
 scanning probe microscopy (SPM) 205
 scanning tunneling microscopy (STM) 206
 scattered light 76
 scattering techniques 206–214
 sedimentation 10–11
 – assessment 199–201
 – dilatant sediments 178
 – polystyrene latex sediments 187
 – potential 65
 – rate 172–178, 234
 – rheological measurements 233–235
 – sediment height 185, 216–217
 – suspensions 171–192
 – velocity 172
 sedimentation method 121
 segments
 – density distribution 111–112, 119–122
 – fraction of 118–119
 “self-structured” systems 183–186
 semidilute solutions 175
 separation, charge 64
 shear
 – high-frequency modulus 164
 – plane 63
 – stress 176–177, 219
 – thinning/thickening systems 221
 silica 179
 – precipitated 194–195
 silicates 191
 sinking time 45
 size reduction, particles 178
 slow aggregation 260
 Smoluchowski rate 215
 Smoluchowski treatment 68–71
 sodium dodecyl sulfate 96–98
 sodium montmorillonite 179, 182
 soft interaction 244
 – electrostatic 152–153, 246–248
 “solid-like” behavior 151
 solid/liquid interface 49–62, 93–103
 – characterization 194–199
 – polymeric surfactants 107–129
 solid substrates 22
 solid suspensions 160–164
 solids
 – hydrophobic 45–46, 103–104
 – immersion 21
 – low-/high-energy 31
 – particulate 182–183
 – viscoelastic 227

- solutions
 - air/solution interface 103
 - athermal solvents 115
 - micellar 36–37
 - reduced solvency 137
 - (semi)dilute 175
 - solvent chemical potential 133
 - surfactant 44–45
- sorbitan esters 89–90
- spans 89–90
- specific adsorbed ions 52–53
- spherical particles 153
- SPM (scanning probe microscopy) 205
- spontaneous spreading 18
- spontaneous wetting 44
- spoon 238
- spreading 17–29
 - spontaneous 18
 - surfaces 25–26
- stability assessment 193–217
 - rheological 219–241
- stability ratio 215
- stabilization
 - dispersions 9
 - electrostatic 49–62
 - emulsions 61
 - suspensions 131–149
- standard lattices 210
- standing suspensions 164–168
- steady-state measurements 220–225
- steady-state shear stress 219
- step change 225
- steric interaction 153–156
- steric stabilization 131–149
 - dispersions 136–138, 240–241, 248–250
 - suspensions 245
- Stern–Grahame model 52, 67–68
- Stern–Langmuir equation 6–7
- Stern–Langmuir isotherm 94
- STM (scanning tunneling microscopy) 206
- Stokes–Einstein equation 60, 77, 121
- Stokes' law 172
- Stokes' velocity 172
- storage modulus 257, 266
- strain sweep 231–232, 238–239
 - latex dispersions 261
- streaming potential 65
- stress
 - shear 176–177, 219
 - thermal 243
 - yield 260
- strong flocculation 258, 261–263
- structure
 - Aerosol OT 46
 - amine ethoxylates 90
 - assessment 194–199
 - clays 51
 - doublet floc structure model 267–268
 - electrical double layer 51–52
 - INUTEC® 92
 - “self-structured” systems 183–186
 - solid/liquid interface 49–62
- submersion 45
- substitution, isomorphic 50–51
- substrates
 - alumina 98
 - carbon 96
 - porous 17
 - solid 22
- sulfates 86
- sulfonated alkyl naphthalene formaldehyde condensates 93
- sulfonates 86
- supernatant liquids 73
- surfaces
 - charge 49–51, 194–195
 - coverage 116
 - critical tension 31–47
 - hydrophobic 94–97, 145
 - ions 49–51
 - liquid spreading 25–26
 - oxide 49–50
 - polar 97–98
 - rough 28
 - tension 2, 23–25, 36
 - tilted 27
- surfactants
 - adsorption 33–34, 93–103, 196–199
 - amphoteric (zwitterionic) 86–87
 - anionic 85–86
 - cationic 86, 240
 - concentration 2
 - contact angle measurement 44–45
 - ionic 5, 94–98
 - nonionic 87–88, 98–104
 - polymeric 90–93, 107–129
 - steric stabilization 131–136
- suspensions
 - bulk properties 216
 - characterization 193–217
 - coagulated 258, 261–263
 - coarse 165
 - concentrated 151–169, 243–270
 - concentration range 11–12
 - (de)stabilization 131–149
 - dilute/concentrated 12, 160–164, 243–270

- electrostatically stabilized 184, 261–263
- flocculated 59–62, 250–258
- particle dimensions 11
- polydisperse 213, 247
- rheological measurements 219–241
- rheology 243–270
- sedimentation 171–192
- solid 160–164
- standing 164–168
- sterically stabilized 245
- viscoelastic properties 249–250
- syneresis 233–235

t

- tails 117
- TEM (transmission electron microscopy) 204
- temperature
 - CFT 215, 241
 - effect on adsorption 104
 - effect on flocculation 266–267
 - electroacoustic methods 82–83
- tension
 - adhesion 20–22
 - critical 31–47
 - surface 2, 23–25, 36
 - wetting 20
- tetrafunctional products 91
- theories and models
 - Casson model 222
 - DLVO theory 57–59, 157, 183–184
 - doublet floc structure model 267–268
 - elastic floc model 259, 268–269
 - electrostatic-patch model 141
 - fractal flocculation concept 259–260
 - Fraunhofer theory 209–210
 - impulse theory 258–259
 - model nonionic surfactants 103–104
 - Stern–Grahame model 52, 67–68
- thermal stress 243
- thermodynamic treatment 19–20
- theta solvent 115
- thickeners 235
 - high molecular weight 178–179
- thickness
 - adsorbed layer 119–122, 126–128
 - hydrodynamic 127, 131
- thixotropy 179
 - flow 223–225
 - negative 223–225
- three-dimensional network 250
- three-phase line 19
- tilted surfaces 27
- time-average light scattering 207–208

- time dependence, viscosity 179
- translational diffusion coefficient 212
- transmission electron microscopy (TEM) 204
- trifunctional products 91
- tristyrylphenol 88
- turbidity measurements 208
- tweens 89–90

u

- ultramicroscopic technique 73–76, 202
- ultrasound vibration potential (UVP) 79

v

- valency, counterions 152
- van der Waals forces 8, 23, 54–57, 156–157
 - doublet floc structure model 267
- vector analysis, complex modulus 230–231
- velocity
 - electroosmotic 69
 - laser velocimetry 76–78
 - sedimentation 172
- Verwey, Deryaguin–Landau–Verwey–Overbeek theory 57–59, 157, 183–184
- viscoelastic systems 225
 - oscillatory response 229–230
 - suspensions 249–250
- viscosity 65–66
 - dynamic 230–231
 - relative 246
 - residual 228, 234
 - reversible time dependence 179
 - viscosity–volume fraction curve 246
 - viscous response 151, 225
 - zero shear 228, 234
- viscosity method 121
- von Smoluchowski, *see* Smoluchowski

w

- Washburn, Rideal–Washburn equation 43–44
- water drops, contact angle 18
- weak flocculation 136–137, 165, 251–258
- Wenzel's equation 28–29
- wet milling 8–9
- wettability, powders 45
- wetting 1–8, 17–29
 - critical surface tension 31–47
 - dynamic processes 34–42
 - spontaneous 44
 - surfactants 31–47
 - tension 20
 - wetting agents 45–46
 - wetting line 19

Wilhelmy plate technique 21
– methods and techniques 21
work, ad-/cohesion 22–23

x

X-ray sedimentation 200
xanthan gum 11

y

yield stress 260
yield value, Bingham 251, 254, 264

yield variation 182, 189, 240
Young's equation 19–20

z

zero shear viscosity 228, 234
zeta potential 63–83
– calculation 68–73
– measurement 73–78, 195–196
zwitterionic surfactants 86–87

