

## Index

### a

acid mantle 275, 295  
 active ingredient 121  
 active substance groups 291–292  
 activity coefficients 140  
 additives 290–291  
 adhesion force 32–33  
 aerosil silica 89  
 airless dispenser 289, 307, 309–310  
 aluminophosphates (AlPOs) 193–198  
 amphiphilic creams 51  
 amplitude dependence 65–66  
 anisotropic particles 23  
 apparent shear stress 14, 17, 61  
 apparent yield stress 8, 59  
 aqueous clay gels 87–89  
 – organo-clays (bentonites) 76–89  
 aqueous continuous phase 318–319  
 aqueous polystyrene latex model suspensions 100  
 Arrhenius equation 96  
 associative thickeners 75, 82–86  
 atom connectivity indices 148  
 atom interaction parameters (AIPs) 148  
 attractive particles 19, 28–36  
 average droplet diameter 116

### b

Bancroft rule 280  
 barley 230  
 BASIL process 179–180  
 Batchelor equation 18  
 bean 234–235  
 beautifications cosmetic products 276–277  
 bentonites, *See* organo-clays (bentonites)  
 benzyl esters 289  
 binary mixtures, of ionic liquids 182–183, 189–191

– physicochemical properties 183–186  
 – potential applications 188–189  
 – structural investigations 186–188  
 biological product design 1  
 biological value (BV) 257  
 bread and bakery products 262  
 broad bean 235  
 Brownian dispersions, *See* colloidal suspensions  
 bulk modulus 99  
 butyl ester 289

### c

canola protein 234, 256  
 capillary forces, in suspension rheology 33–34  
 capillary number 41  
 capillary rheometer 15–16  
 casein 318–319  
 catalytic hydrogenation reactions, in ionic liquids 201, 209  
 – early developments 202–203  
 – SILCA-type materials 205–208  
 – stereoselective hydrogenation reactions 203–204  
 – thermomorphic phases 204–205  
 cationic surfactants 113  
 cavity transfer mixers (CTMs) and controlled deformation dynamic mixers (CDDMs) 325–326  
 celiac disease 265  
 Center for Energy Resources Engineering (CERE) 164  
 centrifuge 97  
 cereal crop plants gelation  
 – maize/corn 229  
 – rice proteins 228  
 – sorghum 229

- cereal crop plants gelation (*contd.*)
  - wheat proteins 227–228
- cereal proteins, in gelation 222
- chemical product design 1
- circumferential velocity 14
- cloud point 133
- coagel phase 319
- coagulation 106
- coalescence 55–56, 97, 109, 315, 317, 322–323, 328, 332–335, 337, 339
  - correlation with elastic modulus 118–119
  - emulsion coalescence assessment and prediction techniques 115–119
  - and Ostwald ripening 109
  - rate 116
- cohesive energy 119
- cohesive energy ratio (CER) 135
- cold gelation 239–240, 319
- colloidal suspensions rheology 16–17
  - attractive particles 28–36
  - hard spheres 17
    - non-spherical particles 20–23
    - suspension of spheres viscosity in Newtonian media 17–20
  - particle size distribution effects 36
  - repulsive particles 10–28
  - shear thickening 38–40
- combination test 59
- combined temperature–time test 71–73
- complex viscosity 11
- $\beta$ -conglycinin 230
- concentric cylinder measuring system 12–13
- conductivity 176
- cone-and-plate measuring system 14–15
- constant stress (creep) experiments 79, 109–110
- Cook's kinetic method 187
- cosmeceuticals 274, 277, 288, 291–292
  - design elements 310
  - differences with drugs 278–279
  - effects 293
  - for healthy skin 277–278
  - product performance parameters 311
- cosmetic emulsions rheology 51–52
  - chemistry
    - emulsifier-free products 53–54
    - emulsion production 54–55
    - microemulsions 53
    - modern emulsifiers 52–53
    - processes occurring during emulsification 55
    - serrated disc disperser 55–56
    - skin care and cleansing 53
  - dynamic mechanical tests (oscillation) 65
    - amplitude dependence 65–66
    - combined temperature–time test 71–73
    - frequency test 68
    - structure breakdown and build-up 67–68
    - temperature dependence 68, 70
    - time dependence 68
  - measurements
    - creep and creep recovery test 62–63
    - ideal elastic behavior 62
    - ideal viscous behavior 62–63
    - Newtonian flow behavior 61
    - real viscoelastic behavior 63
    - stationary flow behavior 56–58
    - steady flow curve 63–65
    - stress ramp test 58–61
- Cosmetics Directive annex 290
- costructure-directing agents (co-SDAs) 198–199
- Couette mode 13
- Coulter Counter 116, 117
- cowpea 236–237
- Cox–Merz rule 27
- cream cheese 330–331
- creaming and sedimentation 95–96
  - accelerated tests and limitations 96
  - correlation examples with residual (zero shear) viscosity
    - aqueous polystyrene latex model suspensions 100
    - creep measurements for creaming prediction 104
    - emulsion creaming prediction 102–103
    - non-Newtonian liquids sedimentation 101
    - oscillatory measurements for creaming prediction 104–105
    - thickeners 101–102
  - emulsion coalescence assessment and prediction techniques 115–116
    - coalescence rate 116
    - cohesive energy 119
    - correlation between elastic modulus and coalescence 117–119
    - storage modulus measurement as function of time 117–118
    - viscosity measurements 116–117
    - yield value measurement as function of time 117
- flocculation
  - and restabilization of clays using cationic surfactants 113

- – of sterically stabilized dispersions 113–114
- – of sterically stabilized emulsions 114–115
- flocculation assessment and prediction
- – constant stress (creep) experiments 109–110
- – Derjaguin–Landau–Verwey–Overbeek (DLVO) theory 105–108
- – dynamic (oscillatory) measurements 110–112
- – Ostwald ripening and coalescence 109
- – steady state shear stress–shear rate measurements 109
- – study techniques 108
- – wall slip 108–109
- high gravity force application 96–97
- rheological prediction techniques 98
- syneresis 99
- creams 51
- creep and creep recovery test 62–63
- creep measurements, for creaming prediction 104
- critical capillary number 326–327
- critical compressibility factor 128
- critical micelle concentration (CMC) 133–134
- critical packing parameter (CPP) 135
- critical shear stress 60
- crosslinked gels (chemical gels) 78, 79
- crosslinked polymers 76, 78, 80
- crosslinking, of proteins 224, 228, 329, *See also* microbial transglutaminase (MTG)
- cross-over point 112
- cruciferin 234
- cycles, for product design optimization 301
- cycle test, *See* combined temperature–time test

## d

- dairy cream 331
- deamidation 259
- Deborah number 79
- Debye length 24
- Derjaguin–Landau–Verwey–Overbeek (DLVO) theory 24, 105–108
- dermal membrane structure (DMS) cream 54
- dermatological creams and features 275
- dermatological products, legal basis in Europe 279
- designer solvents 182, 200

- Design Institute for Physical Property Data (DIPPR) database 156, 160
- DEThERM 156–158, 162–164
- dielectric constant 128–129
- dilatancy 95
- dimensionless numbers and process functions 326–328
- dimensionless shear rate, *See* Péclet number
- disperse systems rheology 7–8
  - basics 8–11
  - colloidal suspensions 16–17
    - – attractive particles 28–36
    - – hard spheres 17–23
    - – particle size distribution effects 36–38
    - – repulsive particles 10–28
    - – shear thickening 38–40
  - emulsions 40–46
  - experimental methods 12, 15–16
    - – capillary rheometer 15–16
    - – rotational rheometry 12–15
- Dortmund DATABASE (DDB) 156, 159, 164
- double logarithmic plot of viscosity versus shear stress 60
- droplet aggregation 334
- droplet relation time 41
- droplet volume fraction 41–42
- dynamic (oscillatory) measurements 79, 110
  - oscillatory sweep measurements 112
  - strain sweep measurements 111–112
- dynamic mechanical tests (oscillation) 65–66
  - amplitude dependence 65
  - combined temperature–time test 71–73
  - frequency test 68–69
  - structure breakdown and build-up 67–68
  - temperature dependence 70–71
  - time dependence 68
- dynamic viscosity 129, 143, 176–177

## e

- effective particle radius 24
- Einstein equation 18, 40
- elastic modulus 30–31
  - and coalescence correlation 118–119
- Electrolyte Database Regensburg (ELDAR) 162–164
- electrolyte solutions properties and database examples
  - CERE DTU chemical engineering 164
  - closed collections 165
  - DDB 164
  - DETHERM/ELDAR 162–164
  - JESS 164
  - Landolt–Börnstein database 165
- electrostatic interactions 25, 27

- electrosteric stabilization 28
  - elongated particles 23–24
  - ELYS database 165
  - emulsification machines 324–326
  - emulsified formulated products 132–133
    - cloud point 133
    - critical micelle concentration (CMC) 133–134
    - hydrophilic–lipophilic balance (HLB) 134–136
    - Krafft temperature 136
    - surface tension 136–137
  - emulsifier-free products 53–54
  - emulsion coalescence assessment and prediction techniques 115–116
    - coalescence rate 116
    - cohesive energy 119
    - correlation between elastic modulus and coalescence 118–119
    - storage modulus measurement as function of time 117–118
    - viscosity measurements 116–117
    - yield value measurement, as function of time 117
  - emulsion formulated products performance properties 142
    - dedicated models 143–144
    - distinct values 142
    - linear mixing rule 142–143
  - emulsions 280
    - application 296
    - creaming prediction 102–103
    - definition, structure, and classification 280–282
  - droplet stability 334
    - preparation in laboratory 285–286
    - production 54–55
    - rheology 40–46
    - stability 282–285
  - environmental, health, and safety related properties 132
  - enzymatically textured plant proteins, for food industry 247–249. *See also* microbial transglutaminase (MTG)
  - ethoxylated fatty alcohols 281
  - evaporation time 129
  - excess enthalpy 185
  - excess molar volume 185
  - excipients 286–288
- f**
- fat continuous food products 335–337
  - Fick's law 300
  - finely divided oxides 87
  - fine-strand gels 239
  - flash point 141–142
  - flocculation
    - assessment and prediction techniques
      - – constant stress (creep) experiments 109–110
      - – dynamic (oscillatory) measurements 110–112
      - – Ostwald ripening and coalescence 109
      - – steady state shear stress–shear rate measurements 109
      - – study techniques 108
      - – wall slip 108–109
    - bridging 29
    - by capillary forces 29
    - of charged particles 29
    - depletion 29
    - and restabilization of clays using cationic surfactants 113
    - of sterically stabilized dispersions 113–114
    - of sterically stabilized emulsions 114–115
    - of sterically stabilized particles 29
  - fluidization, of highly concentrated dispersions 35–36
  - fluorohydrogenate (HF) 181, 193–195
  - food design and engineering 1
  - food emulsion gels 315–316
    - continuous phase 318
    - – aqueous 318–319
    - – emulsion stabilization by emulsifiers and particles 320–321
    - – lipid 319–320
    - – structural hydration in organogel-based emulsions 321
  - creation
    - – basic principles 322–323
    - – dimensionless numbers and process functions 326–328
    - – emulsification machines 324–326
    - – emulsion gel foods production 329–331
    - – high internal phase emulsions (HIPEs) 328
    - dispersed phase 316–317
  - gel-like type emulsions applications 331–332
    - – chemical properties 338–339
    - – fat continuous food products 335–337
    - – microbiological properties 339
    - – water continuous food products 332–335
- frequency test 68–69

fuel cells 180–181  
 fugacity coefficients 140  
 fumed silica 89

## g

GC-based models 128  
 GCVOL model 128  
 gelatin 318  
 gel-like type emulsions applications 331–332  
 – chemical properties 338–339  
 – fat continuous food products 335–337  
 – microbiological properties 339  
 – water continuous food products 332–335  
 gels 75, *See also* microbial transglutaminase (MTG)  
 – classification 76, 80–81  
 – – crosslinked gels (chemical gels) 86–87  
 – – polymer gels 81–86  
 – definition 76  
 – particulate gels 87  
 – – aqueous clay gels 87–89  
 – – gels produced using particulate solids and high molecular weight polymers 90–91  
 – – oxide gels 89–90  
 – rheological behavior 76–77  
 – – constant stress (creep) measurements 79  
 – – dynamic (oscillatory) measurements 79–80  
 – – stress relaxation (after sudden application of strain) 51–52, 77–79, *See also* microbial transglutaminase (MTG)  
 – surfactant systems 91–93  
 Gibbs energy of mixing 141  
 Gibbs-Marangoni effect 56  
 globulins 236  
 glutelins 228, 230  
 gluten 227–228, 262  
 glycinin 230–232  
 glycosylation 259  
 good manufacturing practice (GMP) 278, 302–303

## h

Hansen solubility parameters 131  
 hard sphere 17  
 – mapping 24–25  
 – non-spherical particles 20–23  
 – suspension of spheres viscosity in Newtonian media 17–20  
 Herschel–Bulkley model 44, 59–60, 114  
 hexadienoic acid 289  
 hexagonal phase 91

high frequency modulus, *See* network modulus  
 high internal phase emulsions (HIPEs) 328–329  
 high molecular weight polymers 76  
 high-pressure homogenization 324–325  
 high pressure-induced gels 231, 232–232  
 Hildebrand solubility parameter 131  
 homogeneous formulated products  
 – cost 127  
 – density 128  
 – dielectric constant 128–129  
 – dynamic viscosity 129  
 – environmental, health, and safety related properties 132  
 – evaporation time 129  
 – open cup flash point 131  
 – solubility parameters 130–131  
 – surface tension 132  
 – vapor pressure and heat of vaporization 130  
 Hooke's law of elasticity 10  
 Hookean body 62  
 house of cards structure 88  
 hyaluronic acid 287  
 hydroclusters 39–40  
 hydrolysis 258–259  
 hydrophilic creams 51  
 hydrophilic–lipophilic balance (HLB) 134–136, 280  
 hydrophilic silica 90  
 hydrosomes 93  
 hydrothermal synthetic techniques 191

## i

ICAS-property package 145  
 ideal elastic behavior 62  
 ideal viscous behavior 62–63  
 intrinsic viscosity 23, 41  
 ionic liquids 169–170  
 – abbreviations 170  
 – as acido-basic media 171, 182  
 – – conductivity 176  
 – – dynamic viscosity 176–177  
 – – fuel cells 180–181  
 – – organic synthesis 177–180  
 – – structure 172–174  
 – – synthesis 171–172  
 – – thermal properties 175–176  
 – binary mixtures 182–183, 189–191  
 – – physicochemical properties 183–186  
 – – potential applications 188–189  
 – – structural investigations 186  
 – catalytic hydrogenation reactions 201, 209

- ionic liquids (*contd.*)
  - early developments 202–203
  - SILCA-type materials 205–208
  - stereoselective hydrogenation reactions 203–204
  - thermomorphic phases 204–205
  - and hyperbranched polymers 165–166, 181
  - nanoporous materials from ionothermal synthesis 191–192, 200–201
  - aluminophosphates (AlPOs) 193–198
  - costructure-directing agents (co-SDAs) 198–199
  - metalloaluminophosphates 199–200
  - silicoaluminophosphates 199
  - zeolites (aluminosilicates) 200
- isomorphic substitution 88
- j**
- Joint Expert Speciation System (JESS) 164
- k**
- kafirins 229
- Krafft temperature 136
- Krieger–Dougherty equation 19, 25, 41–42, 100, 143, 317
- l**
- Laki–Lorand factor 250
- lamellar phase 92
- Landolt–Börnstein database 165
- lecithin, *See* phosphatidylcholine
- legume plant proteins gelation 230–233
  - bean 234–235
  - broad bean 235
  - canola protein 234
  - cowpea 236–237
  - lupin proteins 233
  - oilseed proteins 237–238
  - pea, chickpea, lentil, and pigeonpea (pulses) 236
  - sesame 233
  - sunflower proteins 233–234
  - vegetable/fruit proteins 238
- leguminous/oilseed proteins, in gelation 223
- linear mixing rule 137
- linear viscoelastic region (LVR) 65
- linoleic acid 293
- linolenic acids 293
- lipid continuous phase 319–320
- lipophilic creams 51
- lipophilic substances penetration 298–300
- liquid formulated products thermophysical properties 121–122
  - classification 122
  - functional bulk property modeling 137
    - based on linear mixing rule 137
    - based on nonlinear mixing rules 137
  - functional compound properties in mixtures 140
  - performance related property modeling 140–141
    - emulsion formulated products performance properties 142–144
  - flash point 141–142
  - liquid phase stability prediction 141
    - properties classification 123–124
  - property model classification 124–125
  - pure compound property modeling 126
    - emulsified formulated products 132–137
    - homogeneous formulated products 127–132
  - software tools 144
    - ICAS-property package 145
    - ThermoData Engine (TDE) 144–145
  - liquid phase stability prediction 141
  - load jump 58
  - lotions 51
  - lupin proteins 233, 254–255
- m**
- macro-emulsions 301
- Maillard reactions 259
- maize/corn 229
- margarine 329–330
- Marrero–Gani method 129, 146–147
- Master Sizer 116, 117
- mayonnaise 330
- Medicines Act 278
- melting/phase transition point 186
- metalloaluminophosphates 199–200
- methylparaben 289
- micro-emulsions 53, 282
- microbial transglutaminase (MTG) 248
  - allergenicity of crosslinked plant proteins 265
  - application in food products, containing vegetable protein 261–263
  - catalyzed reactions 249–250
  - crosslinking protein isolates from pea, lupin, and soybean in food models 263–264
  - current sources 250–251
  - enzymatic texturization monitoring methods 264
  - isopeptide bonds 264
  - need for novel sources 251
  - plant proteins allergenicity 265–266

- protein sources modification and improvement strategies for crosslinking 258–261
- safety 264–265
- vegetable proteins suitable for crosslinking 251–258
- micro-emulsions 53, 282
- microgels, *See* crosslinked gels (chemical gels)
- microstructured products 122
- mini-emulsion 301, 306
- modern emulsifiers 52–53
- modified Rackett equation 128
- modifiers, *See* gels
- monoglycerides 319, 321, 336
- monounsaturated fatty acids (MUFAs) 338
- mucuna bean protein concentrate (MPC) 235
- multiple emulsions 282, 316
  
- n**
- nanoemulsions 53–54
- nanoporous materials from ionothermal synthesis 191–192, 200–201
- aluminophosphates (AlPOs) 193–198
- costructure-directing agents (co-SDAs) 198–199
- metalloaluminophosphates 199–200
- silicoaluminophosphates 199
- zeolites (aluminosilicates) 200
- napin 234
- negative ramp 58
- network modulus 86
- Newtonian flow behavior 61
- Newtonian liquids 8, 42
- Newtonian media and suspension of spheres viscosity 17–20
- NIST Chemistry web Book 159, 161
- nonionic surfactants 281
- nonlinear mixing rules 137–140
- non-microstructured products 122
- non-Newtonian liquids sedimentation 101
- non-spherical particles 20–23
- noodles 263
- nutrient value improvement, in plant proteins 260–261
  
- o**
- oat 230
- oil-in-water (O/W) emulsions 51, 315, 321, 326, 333
- oil-in-water-in-oil (O/W/O) 316
- oilseed proteins 237–238
- ointment 51, 279
- oleosomes 92, 93
- opaque gels 239
- open cup flash point 131
- organic synthesis 177–180
- organo-clays (bentonites) 80, 89
- organogel-based emulsions and structurant hydration 321
- oryzanol 320
- oscillatory measurements, for creaming prediction 104–105
- oscillatory sweep measurements 112
- Ostwald's rule stages 329
- Ostwald ripening 337
  - and coalescence 109
- over-processing 328
- oxide gels 89–90
  
- p**
- packing geometry 19
- Pal equation 143
- palierne emulsion model 43–44
- panthenol 294
- parabens 289
- parallel-plate measuring system 13–14
- particle size distribution effects 36–38
- particle volume fraction 7, 17–19, 23, 25–26, 30, 32, 37
- particulate gels 87
  - aqueous clay gels 87–89
  - gels produced using particulate solids and high molecular weight polymers 90–91
  - oxide gels 89–90
- patch test studies 290, 292, 297
- pea, chickpea, lentil, and pigeonpea (pulses) 236
- pea protein 254
- péclet number 20, 22
- pectins 318
- pendular state 33
- perfume 290–291
- phosphatidylcholine 53–54
- physical gels 81–82
- physical product design 1
- pickering emulsions 284
- plateau modulus 44
- polymer coil overlap concentration 81
- polymer gels
  - physical gels obtained by chain overlap 81–82
  - produced by associative thickeners 82–86
- poly-unsaturated fatty acids (PUFAs) 335, 338
- positive ramp test 57
- post-hardening 330
- potato protein 256–257

- precipitated silica 89
  - preservations 288–290
  - primary bonds 336
  - Princen–Kiss model 45
  - protein aggregation 334–335
  - protein digestibility corrected amino acid score (PDCAAS) 257
  - protein efficiency ratio (PER) 257
  - proteins gels 221–222, 318
    - cereal crop plants
      - – maize/corn 229
      - – rice proteins 228
      - – rye, oat, and barley 229–230
      - – sorghum 229
      - – wheat proteins 227–228
    - evaluation 226–227
    - factors determining physical properties 224–226
    - legume plant proteins gelation 230–233
      - – bean 234–235
      - – broad bean 235
      - – canola protein 234
      - – cowpea 236–237
      - – lupin proteins 233
      - – oilseed proteins 237–238
      - – pea, chickpea, lentil, and pigeonpea (pulses) 236
      - – sesame 233
      - – sunflower proteins 233–234
      - – vegetable/fruit proteins 238
    - product application 238–240
    - prospects and challenges 240
    - structure and formation 222, 224
    - proteolysis 234
- q**
- QSAR model 144
  - QSPR models 134, 136
  - Quemada model 19, 25, 38
- r**
- real viscoelastic behavior 63
  - red bean globulin (RBG) 235
  - relative viscosity 8, 23, 30, 37
  - relaxation modulus 78
  - release jump 58
  - repulsive particles 10–28
  - residual (zero shear) viscosity and sedimentation and creaming correlation examples
    - aqueous polystyrene latex model suspensions 100
    - creep measurements for creaming prediction 104
      - emulsion creaming prediction 102–103
      - non-Newtonian liquids sedimentation 101
      - oscillatory measurements for creaming prediction 104–105
      - thickeners 101–102
  - rheopexy 9
  - rice proteins 228, 253–254
  - rotational Péclet number 22–23
  - rotational relaxation time 22
  - rotational rheometry 12
    - concentric cylinder measuring system 12–13
    - cone-and-plate measuring system 13–15
    - parallel-plate measuring system 13–14
  - rotor–stator type machines 324–325
  - rye 229
- s**
- saturated fatty acids (SAFAs) 319, 320, 335–336, 338
  - SciFinder 266
  - searle method 12, 13
  - self-healing, of interfacial film 56
  - self-structured systems 76
  - semi-dilute range 81
  - serrated disc disperser 55–56
  - sesame 233, 255
  - shear modulus 11
  - shear rate 14–15
  - shear stress 14, 98
  - shear thickening 38–40
  - shear-thinning region 20
  - short-term stability, of emulsions 56
  - SILCA-type materials 205–208
  - silicoaluminophosphates 199
  - single point method 16
  - skin care and cleansing 53
  - skin care products design 273–276
    - cosmeceuticals
      - – differences with drugs 278–279
      - – for healthy skin 277–278
    - cosmetic cream bottles 306–309
    - cosmetic products for beautifications 276–277
      - cream structure 286
        - – active substance groups 291
        - – additives 290–291
        - – excipients 286–288
        - – preservations 288–290
        - – typical effects of cosmetics 292
      - element design 310–311
      - emulsions 280
        - – definition, structure, and classification 280–282



- – preparation in laboratory 285–286
  - – stability 282–283
  - essential active substances from medical point of view 292
  - – linoleic acid 293
  - – linolenic acids 293
  - – panthenol 294
  - – urea 294
  - skin care products production 302–306
  - skin penetration 294
  - – emulsion application 296
  - – lipophilic substances penetration 298–300
  - – proof of performance 297–298
  - – skin structure 294–295
  - targeted product design 301–302
  - small amplitude oscillatory shear (SAOS) test 10, 34
  - smart colloids 87
  - solid catalyst with ionic liquid layer (SCILL) 205–206
  - solubility parameters 130–131
  - solubilization and hydrothermal treatment 259
  - solvent viscosity 20, 23
  - solvothermal method 191
  - sorbic acid 289
  - sorghum 229, 257–258
  - soybean products 261
  - soybean protein 230
  - soy protein 252–253
  - soy protein concentrates (SPCs) 252
  - soy protein isolate (SPI) 230–232, 252
  - spheroids 20
  - spring constant 78
  - Standard Reference Data Program 159
  - stationary flow behavior 56–58
  - stationary viscosity value 57
  - steady flow curve 63–65
  - steady state shear stress–shear rate measurements 109
  - stearate creams 52
  - step test 57
  - stereoselective hydrogenation reactions 203–204
  - sterically stabilized dispersions 113–114
  - sterically stabilized emulsions 114–115
  - sterol 320
  - stokes–Einstein equation 20
  - storage modulus measurement, as function of time 117–118
  - strain sweep measurements 111–112
  - strain test, *See* amplitude dependence
  - stratum corneum 295
  - stress ramp test 58–61
  - stress relaxation (after sudden application of strain) 77–79
  - stress–time ramp 57
  - strong gels 76
  - strongly flocculated gels rheology 29–33
  - structure breakdown and build-up 67–68
  - sunflower proteins 233–234, 255–256
  - supported ionic liquid phase (SILP) 205–206
  - surface-affinity difference (SAD) 135–136
  - surface tension 132, 136–137, 143–144
  - surfactant systems 91–93
  - swellable clays 87
  - syneresis 99
- t**
- tangent method 60
  - Taylor equation 40–41
  - temperature dependence 70
  - tempering 335
  - texturized vegetable proteins (TVPs) 247
  - ThermoData Engine (TDE) 144–145
  - thermophysical properties and sources 153
    - complex solutions data 162
    - database examples 155–156
      - – Design Institute for Physical Property Data (DIPPR) database 156, 160
      - – DETHERM 156–158
      - – Dortmund DATABASE (DDB) 156, 159
      - – NIST Chemistry web Book 159
    - electrolyte solutions properties and databases
      - – CERE DTU chemical engineering 164
      - – closed collections 165
      - – DDB 164
      - – DETHERM/ELDAR 162–164
      - – JESS 164
      - – Landolt–Börnstein database 165
    - ionic liquids and hyperbranched polymers 165–166
    - phase equilibria calculations and thermodynamic properties 154
    - reliable sources of data 154–155
  - thickeners 101–102, *See also* gels
  - thixotropy 9–10, 18, 91
  - thread-like micelles 92
  - time dependence 68
  - tissue transglutaminase (TTG) 265
  - tocopherols 284
  - torque 14, 59
  - triacylglycerols (TAGs) 319–320, 329, 335–336
  - triglycerides 319, 320
  - true shear rate 16

**u**

- ultra-high temperature processing (UHT) 339
- undesired substances removal, from vegetable proteins 259–260
- UNIFAC GC-based model 139, 148–149
- urea 294

**v**

- vapor pressure and heat of vaporization 130
- vegetable/fruit proteins 225
- vegetable proteins suitable for crosslinking, with MTG 251–252
  - canola protein 256
  - lupin protein 254–255
  - pea protein 254
  - potato protein 256–257
  - rice protein 253–254
  - sesame protein 255
  - sorghum protein 257–258
  - soy protein 252–253
  - sunflower protein 255–256
  - wheat protein 253
- vicinal 89
- viscoelastic materials 8
- viscosity measurements 116–117
- viscosity ratio 40, 43, 326
- viscosity reduction 36–38
- Votator process 329, 336

**w**

- wall slip 108–109
- water continuous food products 332–335
- water-in-oil (W/O) emulsions 51, 279, 315
- water-in-oil-in-water (W/O/W) emulsions 316
- water-in-water (W/W) emulsions 315
- weaker gels 76
- weakly flocculated gels rheology 29
- Weissenberg–Rabinowitch correction 15, 16
- wheat proteins 227–228, 253
- whey proteins 319

**x**

- xanthum gum 82, 103

**y**

- yield point 59
- yield strain 44–45
- yield stress 8, 31–33, 45, 59–60
- yield value measurement, as function of time 117

**z**

- zein corn 229
- zeolites (aluminosilicates) 200
- zero-shear viscosity 18, 23–24, 28, 37