

## Index

- adsorption, 340
  - planar surface, 343
  - solid sphere, 348
  - vesicle exterior, 349
  - vesicle interior, 349
- affine deformation, 383
- aggregation, 308
  - similarly charged polymers, 192
- amyloid fibril formation, 332
- annealed, 3
- anomalous diffusion, 198
- anti-polyelectrolyte effect, 152
- apparent molar mass, 134
  
- Bjerrum length, 7, 51
- Born free energy, 35, 47
- Born model, 46
- Bragg–Williams theory, 162
- branched macromolecules, 22
- Brownian motion, 197
- brushes, 349
  
- capture through a barrier, 273
- cell model, 82
- charge density parameter, 86
- charge regularization, 95, 126, 300, 425
- circular macromolecules, 23
- clathrate cages, 46
- coacervation, 366
- coacervate phase, 340
- coacervation, 340
  - dipolar theory, 370
- coexistence curve, 285
- coil–globule transition, 30, 130
- collagen fibril formation, 328
- competitive substitution, 363
- complexation, 339
  - intermolecular, 359
- concentrated regime, 188
- concentrated solutions, 177
- concentration fluctuations, 166
- conductivity, 265
- confinement free energy, 239
- conformational entropy, 19
  
- contact theorem, 73
- correlation hole, 138
- Coulomb criticality, 291, 296
- Coulomb law, 36
- Coulomb soup, 4, 434
- Coulomb strength, 102
- Coulomb strength parameter, 86
- Coulomb’s law, 6
- counterion adsorption, 116
- counterion cloud, 59
- counterion release, 362
- coupled diffusion, 245, 256
- critical micelle concentration, 315
- critical point, 285
- critical point in gels, 420
- cylindrical assemblies, 81
  
- Debye length, 8, 62
  - polyelectrolyte solutions, 103
- Debye mode, 247
- Debye structure factor, 19
- Debye–Hückel theory, 35, 61
  - extended, 64
- diblock copolymers, 311
- dielectric media, 38
- dielectric mismatch, 89
- dielectric relaxation, 267
- diffusion, 197, 214
  - cooperative, 216, 251, 255
  - coupled, 256
  - Einstein’s law, 197
  - tracer, 215, 251, 254
- diffusion coefficient
  - fast, 247
- diffusion limited capture, 334
- dipolar theory
  - coacervation, 370
- dipole moment, 37
- dipole–dipole interaction, 8, 108
- dipoles, 53
- disengagement time, 235
- disjoining pressure, 353
- Doi–Edwards theory, 236
- Donnan equilibrium, 144, 385

- Donnan membrane potential, 145  
 Donnan pressure, 144  
 double screening theory, 177  
 dynamic light scattering, 197  
 dynamic structure factor, 227
- Edwards field theory, 168  
 Edwards Hamiltonian, 26  
 Edwards path integral, 26  
 effective interaction, 180  
 Einstein's theory of viscosity, 220  
 electric double layer, 70, 77  
 electroosmotic flow, 208  
 electrophoresis, 202  
 electrophoretic mobility, 202, 219,  
 243, 254  
   Einstein's theory, 202  
   Hückel theory, 204  
   Henry theory, 206  
 electrostatic blob, 123  
 electrostatic excluded volume interaction,  
 104  
 electrostatic persistence length, 109  
 electrostatic screening length, 35, 62  
 electrostatic stretching, 125  
 electrostatic swelling, 119  
 end-to-end distance, 17  
 entangled solutions, 264  
 entropic barrier model, 238  
 excluded volume interaction, 4, 102  
   electrostatic, 104  
 excluded volume interactions, 23  
 excluded volume parameter, 24
- fast mode, 217, 256  
 Feynman path integral, 18  
 fibrillization, 327  
 Fixman parameter, 28  
 flexible polyelectrolytes, 1  
 Flory radius, 28  
 Flory temperature, 25, 166  
 Flory–Huggins theory, 162, 285  
 fluctuations  
   strong, 172  
   weak, 169  
 Fokker–Planck formalism, 276  
 form factor, 18  
 fractal dimension, 32  
 free draining, 231  
 free energy  
   deformation, 382  
   mixing, 381  
 freely jointed chain, 21  
 friction coefficient, 197  
   gel, 406  
   translational, 242  
 Fuoss law, 221
- Gauss law, 36  
 Gaussian chain, 18  
 gel friction coefficient, 406  
 gel swelling, 12  
   confinement, 391  
   isotropic, 384  
   one-dimensional, 392  
   tension, 394  
   two-dimensional, 393
- gels  
   critical point, 420  
   diffusion, 404  
   dynamic light scattering, 409  
   dynamics, 403  
   elasticity, 397  
   high salt, 388  
   length–force relation, 395  
   phase transitions, 416  
   salt-free, 388  
   scaling laws, 413  
   simple elongation, 397  
   simple shear, 398  
   static scattering, 406  
   swelling kinetics, 415  
 genome packaging, 354  
 Ginzburg criterion, 302  
 good solvent, 25  
 Gouy–Chapman length, 70, 73  
 Gouy–Chapman theory, 72, 351  
 Grahame equation, 76  
 ground state dominance, 343
- Helmholtz–Smoluchowski theory,  
 207
- Henderson–Hasselbalch equation, 96  
 Hofmeister series, 48  
 homo polyelectrolyte, 1  
 Huggins coefficient, 221  
 hydrodynamic interaction, 200  
 hydrodynamic radius, 115, 231  
 hydrodynamic screening, 252  
 hydrodynamic screening length, 252  
 hydrophobic effect, 46  
 hydrophobic interaction, 102  
 hydrophobicity criticality, 296
- ideal temperature, 25  
 image charge, 90  
 impedance spectroscopy, 43  
 intrinsically disordered proteins, 153  
 ion cloud  
   size, 66  
 ionic strength, 63  
 isotropic–nematic transition, 322  
   Flory theory, 322  
   Maier-Saupe theory, 322  
   Onsager theory, 322

- kinetics of phase separation, 303
- Kratky–Porod chain, 21
- Kuhn chain model, 16
- Kuhn length, 16
- Kuhn segment, 16
- labeled chain
  - size, 183
- Landau–Ginzburg theory, 287
- Langevin function, 21
- line charge, 87
- liquid–liquid phase separation, 279, 282
- longitudinal mode, 404
- longitudinal modulus, 405
- lower critical solution temperature, 26
- macrophase separation, 279
- Manning condensation, 70, 87
- membraneless organelles, 326, 336, 373
- micellization, 310
- microphase separation, 310, 316
- Navier–Stokes equation, 200
- Nernst–Hartly theory, 248
- non-free draining, 231
- nucleation and growth, 286, 307
- ordinary–extraordinary transition, 10, 200, 216
- Ornstein–Zernicke form, 170
- Oseen tensor, 201
- osmotic bulk modulus, 401
- osmotic pressure, 68, 140, 183
  - gels, 380
- Overcharging, 431
- overlap concentration, 159
- parabolic density profile, 354
- persistence length, 21
  - electrostatic, 109
- plasmon mode, 247, 258
- Poisson equation, 37
- Poisson ratio, 402
- Poisson–Boltzmann, 35, 59
  - linearized, 61
- polyampholytes, 3, 147
- polyelectrolyte peak, 160, 185
- polyzwitterions, 53, 149
- poor solvent, 25
- preaveraging, 230
- primitive path, 234
- proteins, 326
- quenched, 3
- radius of gyration, 17
- random phase approximation, 169, 318
- random walk chain, 16
- reentrant precipitation, 11
- Reentrant Volume Transition, 431
- relaxation time, 215
- reptation model, 233
- restricted primitive model, 59
- Rouse dynamics, 225
- Rouse modes, 225
- Rouse time, 226
- scaling laws
  - correlation length, 174
  - osmotic pressure, 175
  - radius of gyration, 175
- scattering function, 182
- screened Coulomb, 7
- screening length
  - electrostatic, 62
  - excluded volume interaction, 168
  - hydrodynamic, 252
- second virial coefficient, 24, 165
- segment density, 17
- self-avoiding walk, 28
- self-consistent field theory, 26, 353
- semidilute regime, 187
- semidilute solutions, 177
- semiflexible chain, 21
- semiflexible polyelectrolytes, 1
- shear flow, 228
- slow mode, 217, 260
- spherical particles, 79
- spinodal curve, 284
- spinodal decomposition, 286, 304
- Stern layer, 77
- Stokes law, 197
- Stokes–Einstein, 197
- strong segregation limit, 318
- structure factor, 134
- swelling
  - electrostatic, 119
- swelling equilibrium, 387
- tensile force, 20
- theta temperature, 25, 166
- time-dependent Schrödinger equation, 26
- titration curve, 95
- topological correlation, 5, 105
- topological frustration, 277
- topologically frustrated dynamical state,
  - 199, 278
- translocation, 269
- translocation kinetics, 275
- transverse mode, 405
- upper critical solution temperature, 26
- van't Hoff's law, 68
- vertex diagrams, 169
- viruses, 354

- viscosity, 219, 261
  - intrinsic, 221
  - reduced, 221
  - specific, 221
- Voorn–Overbeek theory, 368
- water, 41
  - bound, 49
- weak segregation limit, 318
- worm-like chain, 21
- worm-like counterion cloud, 106
- zeta potential, 77, 210
- Zimm dynamics, 230
- Zimm plot, 34
- Zimm time, 231