

# Index

## A

- 2-(Acetoacetoxy)ethyl methacrylate (AEMA), 53
- Acetylacetone, 45
- N*-Acetylhomocysteinethiolactone, 108
- A<sup>3</sup>-coupling reaction, 2
- ADMET polymerization, 64, 76, 174
- Aggregation-enhanced emission (AEE), 19
- Aggregation-induced emission (AIE), 17, 19
- Aldehydes, 2, 19, 45, 148, 163, 175
- Alkynes, polymerization, 17
- Amine-thiol-ene conjugation, 112
- Amino acids, Strecker synthesis, 2
- N*-(2-Aminoethyl)-4-(2-phenyldiazeyl) benzamide, 147
- Aminolysis, 105
- N*-(Aminoxyacetyl)-*N'*-(*D*-biotinoyl) hydrazine (ARP), 148
- 3-Aminopropyltrimethoxysilane, 149
- Amphiphatic polymers, 87
- 4-(Azidomethyl)-phenylethyl-(dimethyl)-chlorosilane methanethiosulfonate, 147

## B

- Batzelladine, 44
- Bifunctionalized homopolymers, 87
- Biginelli reaction, 2, 43
- Biginelli side-group polymers, 51
- Bis(2-methacryloyl)oxyethyl disulfide, 152
- 9-Borabicyclo[3.3.1]nonane (9-BBN), 187
- Bottlebrushes, 96

- 2-Bromoethyltetra-*O*-acetyl- $\alpha$ -*D*-mannopyranoside, 119
- 2,2'-[Butane-1,4-diylbi(oxymethanediyl)] dioxirane, 138
- Butanethiol, 40

## C

- $\epsilon$ -Caprolactones, 72, 154, 156
- Chain end, 133, 142
- Chitosan, 53
- Citolone, 108
- Click reactions, 3, 9, 43
- Complex architectures, 61
- Concanavalin A, 120
- Coupling reactions, 50
- Cu(I)-catalyzed cycloaddition reaction
  - between alkynes and azides and metal-catalyzed cross-coupling reaction of triazole derivatives, sequential (CuSeq), 10, 12
- Cu(I)-catalyzed cycloaddition reaction
  - between terminal alkynes and azides (CuAAC), 3, 9, 48, 106
- Cu(I)-catalyzed multicomponent reaction
  - between terminal alkynes, sulfonyl azides, and nucleophiles (CuMCR), 5, 10, 11
- Cyclodextrin, 139
- Cyclododecatriene (CDT), 174
- 1,3-Cyclohexanedione, dimedone (5,5-dimethyl-1,3-cyclohexanedione), 45

**D**

- Dansylthiolactone, 125  
Dendrimers, 73, 81  
1-(Deoxylactit-1-yl) chitosan, 78  
1,4-Diallylbenzene, 8  
1,8-Diazabicyclo[5.4.0]undec-7-ene (DBU), 36, 92  
Dibenzylamine, 19  
2,4-Dichlorophenyl acrylate, 35  
Diethylene glycol monomethylester methacrylate, 146  
3,4-Dihydro-2(H)-pyrimidinone (DHPM), 44  
4,4'-Diiodobiphenyl, 7, 8  
*N,N'*-Diisobutyl-1,6-hexanediamine, 30  
Diisopropylethylamine, 30  
2-(2,2-Dimethoxyethyl)phenyl isocyanide, 63, 76  
2,2-Dimethoxy-2-phenyl acetophenone (DMPA), 112  
Dimethyl dioxirane (DMD), 179  
Dimethyltetraphenylsilole (DMTPS), 19  
2,4-Dinitrotoluene (DNT), 28  
2-(2,5-Dioxo-2,5-dihydro-1*H*-pyrrol-1-yl) ethanaminiumtrifluoroacetate, 145  
1,1-Diphenylethylene (DPE), 151  
Dithiobenzoate, 123  
Diynes, 30  
DNA, thiol-terminated, 150  
Dodecatetraene, 7  
Doebner reaction, 4  
Double post-polymerization modification, site-specific, 105  
Dual-functional polymers, 87

**E**

- Epoxidation, 176  
Epoxide, 163  
Ethyl acetoacetate, 45  
Ethyl 2-mercaptoacetate, 35

**F**

- Functionalized vinyl monomers, 61

**G**

- Gewald reaction, 2, 4  
Glycopolymers, 120  
Graft polymers, 139, 187  
Groebke–Blackburn–Bienaymé reaction, 3

**H**

- Hantzsch reaction, 2, 4, 44  
Hexaphenylsilole (HPS), 19  
Homocysteine- $\gamma$ -thiolactone, 107  
Hydrochlorination, 175  
Hydrogels, biocompatible, 61  
Hydrogenation, 163, 170  
4-Hydroxycoumarin, 45  
Hydroxyl/amine/thiol–isocyanate coupling, 48  
2-(Hydroxymethyl)-2-[(prop-2-yn-1-yloxy)methyl]propane-1,3-diol, 154  
 $\alpha$ -Hydroxy *N*-acylindoles, 64  
5-Hydroxy-2-nitrobenzaldehyde, 70  
4-Hydroxyquinolin-2(1*H*)-one, 45

**I**

- 1,3-Indanedione, 45  
5-Iodo 1,2,3-triazoles, 10  
Isocyanides, 5, 10  
Isomerization, 173

**J**

- Janus-type dendrimers, 61

**K**

- Kabachnik–Fields reaction, 2, 4

**L**

- Lactide, 64  
Lectins, 120  
2,6-Lutidine, 30

**M**

- Mannich reaction, 2, 18  
Meldrum's acid (2,2-dimethyl-1,3-dioxane-4,6-dione), 45  
Methionine, 107  
Methylene diphenyl diisocyanate, 187  
Modular nature, 61  
Multicomponent polymerization (MCP), 17  
Multicomponent reactions (MCRs), 43, 62  
isocyanide-based (IMCR), 3  
metal-catalyzed, 1, 6  
Multistep functionalization, 163

**N**

- Nifedipine, 44
- N*-Isopropylacrylamide (NIPAM), 72, 117
- Nitroacetone, 45
- 4-Nitrobenzoyl chloride (NBC), 28
- 4-Nitro-7-piperazin-1-yl-2,1,3-benzoxadiazole, 147
- Norbornenyl, 75

**O**

- One-pot conjugation, 105
- Organometallic catalysts, 1
- Oxazolidones, 189
- Oxidation, 163, 174
- 4,4'-Oxidianiline, 35

**P**

- Passerini three-component reaction, 2, 3, 18, 61
- PEGylation, proteins, 61
- Percarboxylic acids, 177
- Petasis reaction, 4
- Photodegradable polymers, 70
- Photoluminescence (PL), 22
- Photoresponsive polymers, 61
- Picric acid (PA), 28
- Poly(1-aceto-1-pentafluorophenoxy carbonyl-2-vinylcyclopropane) [poly(APVCP)], 114
- Poly(AEMA), 53
- Poly( $\alpha$ -hydroxy acid), 64
- Polyamidines, 29
- Poly( $\beta$ -hydroxy amines), 138
- Polybutadienes, 163
  - carbonyl-terminated (CTPB), 165
  - hydroxyl groups, 186
  - hydroxyl-terminated (HTPB), 165
  - multistep functionalization, 181
- Poly(3,3'-diethoxypropyl methacrylate), 148
- Poly(ester ether ketone)s, 8
- Poly(1-ethoxyethyl glycidyl ether), 135
- Poly(ethylene glycol) (PEG), fluorescent
  - protein-reactive, 125
  - bispropiolates, 144
  - glycidol-bearing, 135
- Poly(ethylene glycol) methyl ether acrylate (PEGA), 66
- Poly(ethylene glycol) methyl ether methacrylate (PEGMA), 66
- Poly(ethylene oxide) (PEO), 50
- Polyethylenimine, 99

- Poly(glycidyl methacrylate), 87, 89
- Polyhedral oligomeric silsesquioxanes (POSS), 147
- Polyhydantoins, 79
- Poly(4-hydroxybutyrate)s, 68
- Polyimides, 32
- Polymer-analogous reactions, 163
- Polymer modification, 43
  - synthesis, 1, 43
- Poly(*N*-isopropylacrylamide) (PNIPAM), 142
- Poly(*N*-sulfonylamidines), 30
- Poly(*N*-sulfonylimidates), 12, 34
- Poly(pentafluorophenyl acrylate) (PPFPA), 137
- Poly(pentafluorophenyl-4-vinylbenzene sulfonate), 137
- Poly(*p*-nitrophenylmethacrylate)-*b*-poly(diethoxypropyl methacrylate), 136
- Poly(*p*-phenylenevinylene), 8
- Poly(propylene oxide) (PPO), 50
- Polysaccharides, crosslinking, 77
- Polystyrene (PS), 114
- Polystyrene-coated silica nanoparticles, 149
- Polythiolactones, 115, 118
- Polythiols, 115
- Poly(vinyl alcohol) (PVA), 52
- Poly(4-vinylbenzaldehyde), 114
- Post-modification, 163
- Postpolymerization modification (PPM), 11, 43, 48, 52, 87
  - double, site-specific, 105
- Povarov reaction, 4
- Proteins, 51
  - PEGylation, 61

**R**

- Reversible-addition fragmentation transfer (RAFT), 114
- Rubber-toughened resins, 188

**S**

- Semicarbazides, 108
- Sequence-defined structures, 61
- Sequential reactions, 87, 133
- Side chains, 133
- siRNA delivery, 87, 99
- Sodium di-(–)-menthyl methylmalonate, 8
- Sonogashira–Fiesselmann cyclocondensation tandem reaction, 35
- Star-shaped polymers, 133, 151, 154
- Strecker amino acid synthesis, 2

Styrene–butadiene–styrene (SBS), 50  
Subsequent reactions, 163  
*N*-Sulfonylamidines, 9  
Sulfonyl azides, 29, 31  
Sulfosuccinimidyl-4-(*N*-maleimidomethyl)-  
cyclohexane-1-carboxylate, 150  
Surface modification, 133  
Suzuki–Miyaura cross-coupling, 10

**T**

Tailor-made materials, 61  
Tandem polymerization, 17  
Terephthalaldehyde, 19  
Thermosets, PBD epoxide, 188  
4,4'-Thiobis(benzenthio), 35  
 $\gamma$ -Thiobutyrolactone, 109  
Thiolactones, 105  
Thiol-click reactions, 105  
Thiol–disulfide exchange, 124  
Thiol–ene click coupling (TECC), 147  
Thiol–epoxy reaction, 87, 90

*p*-Toluenesulfonyl azide, 30  
Triazoles, 9  
Trimethyl-4H-1,3-dioxin-4-one, 45  
Tris(benzyltriazolylmethyl)amine, 30

**U**

Ugi four-component reaction, 2, 3, 6, 61  
Ugi polycondensation, 77

**V**

van Leusen three-component reaction, 2, 3  
Vertically aligned carbon nanofibers  
(VACNF), 149  
*N*-(4-Vinylbenzenesulfonyl)  
homocysteine- $\gamma$ -thiolactone, 117  
Vinylthiolactone, 117

**W**

Wacker oxidation, 175