

Index

a

additive-free all-organic aqueous batteries 235
 Ag_2 -BDC electrode 203
 air-stable radicals 101
 aliphatic dicarboxylates 211–213
 alkaline earth metal terephthalates 202
 all-organic batteries
 metal-free carriers 250–254
 small molecule organics application 242
 water-based electrolyte 245
 all-organic DMPA/FL flow cell 261
 all-organic potassium ion hybrid capacitor 250
 all-organic proton batteries 229
 all-organic redox flow batteries (ORFBs) 229–254
 AORFB 257–260
 AORFB vs. NORFB 256
 cell configuration 255–256
 NORFB 260–264
 principle of molecular engineering 256–257
 all-plastic electrode-based Li-ion symmetric battery 243
 ambipolar redox molecules 111
 anchoring type all-organic batteries 235
 aqueous all-organic redox flow batteries 257–260
 aqueous ORFBs (AORFBs) 255
 aromatic dianhydride-derived PIs 179
 aromatic dicarboxylates 200–211
 conjugated core effects 203–209
 metal cation effects 201–203
 multi active sites 210–211

substituent group effects 209–210
 asymmetric organodisulfides 20
 azobenzene 25
 azo compounds 217–220
 azo electrode materials 24

b

1,2-benzenedithiol (BDT)-based small-molecule organometallic complexes 132
 4,4'-Biphenyldicarboxylate (BPDC) salt 204
 biphenyl-linked CTFs (CTF-2) 220
 bipolar all-organic proton batteries 235–237
 bipolar charge storage mechanism of polymerized DAAQ 173
 bipolar mechanism of the CuTAPc electrode 130
 bipolar-type materials 13
 [5,15-bis(ethynyl)-10,20-diphenylporphinato]copper(II) (CuDEPP) 128
 1,8-bis(2-(2-(2-hydroxyethoxy)ethoxy)ethoxy)anthracene-9,10-dione (AQ-1,8-3E-OH) 55
 2,5-bis(*p*-benzoquinonyl) furan (QFQ) 43
 2,5-bis(*p*-benzoquinonyl) pyridine (QPQ-2) 43
 2,6-bis(*p*-benzoquinonyl) pyridine (QPQ-1) 43
 1,4-bis(diphenylphosphine)tetrasulfide 88
 blatter radicals 23
 BMEPZ catholyte 261

- c**
- Ca-BDC electrode 202
 - calix[4]quinone (C4Q) 41
 - calix[8]quinone (C8Q) 40
 - capacity retention rate of polySGN cathode 148
 - 3-carbamoyl-2,2,5,5-tetramethylpyrroline-1-oxy (CPL) 114
 - carbon-coating Li₂-BDA electrode 207
 - carbonyl-based organic electrodes 35
 - anhydrides 59–61
 - imides 57–59
 - quinone compounds 36–57
 - carbonyl compounds 3
 - carbonyl-derived polymers 167–182
 - polyanhydrides 181–182
 - polyimides 176–181
 - polyquinones 168–175
 - carbonyl redox-active materials
 - characterization methods 16–18
 - redox mechanisms 14–16
 - cardanol-based benzoxazine (Ca) 153
 - cationic all-organic batteries 230
 - cationic grafted 4-OH-TEMPO (g⁺-TEMPO) 115
 - choline-quinone derivatives 56
 - CL-PTGE/SWCNT composite electrode 188
 - CNT composite cathode 67
 - CNT composite electrode 148
 - CNT for aqueous ZIBs 47
 - CNTs/VS₄/DPDS cathode 93
 - COF-F-SeS₂ cathode 167
 - conjugated carboxylates
 - aliphatic dicarboxylates 211–213
 - aromatic dicarboxylates 200–211
 - conjugated sulfonamides 25
 - covalent organic frameworks 220–222
 - covalent organic frameworks-derived polymers 182–185
 - covalent organosulfur polymers 163–167
 - covalent triazine frameworks (CTFs) 164, 220
 - CPL/BTMAP-viologen aqueous RFB 114
 - CSM-450 159
- CTF-based covalent organic nanosheets 220
- Cu-HHTP cathode in Li ion batteries 138
- Cu tetraaminephthalocyanine (CuTAPc) 129
- Cyclohexanehexone 270
- d**
- DBMMB-based NORFB 261
 - 2,3-diamino-1,4-naphthoquinone (DANQ) 38
 - 2,3-diaza-anthracene-dione (DAD) 55
 - 2,3-diaza-anthracene-diones anolyte active material 55
 - 5,10-dihydro-5,10-dimethylphenazine [DMPZ] catholyte 261
 - 4,8-dihydrobenzo[1,2-b+4,5-b']dithiophene-4,8-dione/graphene (BDT-G) composite cathode material for SIBs 42
 - 2,6-dihydroxyanthraquinone (2,6-DHAQ) 54
 - 2,6-dihydroxyanthraquinone (DHAQ) anolyte 18
 - diisopropyl xanthogen polysulfide (DIXPS) 87
 - dilithium 1,4-phenylenebis((methylsulfonyl)amide) 26
 - dilithium 2,6-naphthalene di-carboxylate (Li₂-NDC) 203
 - dilithium thiophene-2,5-dicarboxylate (Li₂-ThDC) 208
 - 2,5-Dimethoxy-1,4-benzoquinone (DMBQ) for MIBs 50
 - 7,8-dimethylalloxazine (LC) in lithium batteries 28
 - dimethyl-substituted norcorrole nickel (II) complex 128
 - dimethyl trisulfide (DMTS) 3
 - 1,4-dinitrobenzene 27, 30
 - dipentamethylenethiuram tetrasulfide (PMTT) 79
 - diphenyl disulfide (DPDS) 66
 - disodium 2,5-difluoroterephthalate (Na₂-DFTP) 210
 - disodium rhodizonate (Na₂C₆O₆) electrode 18
 - disodium salt of 2,5-dihydroxy-1,4-benzoquinone (Na₂DBQ) 42
 - DPTS-Se hybrid electrode 85

e

- electrochemical behavior of poly (5-amino-1,4-dyhydroxy anthraquinone) 173
 electrochemical energy storage technologies 1–2
 electrochemical performance anthraquinone-1,5-disulfonic acid sodium salt (AQDS) 49
 of azobenzene-4,4'-dicarboxylic acid potassium salt (ADAPS) 218
 of azobenzene-4,4'-dicarboxylic acid sodium salt (ADASS) 218
 of chlorine-substituted polymer poly(2-chloro-3,5,6-trisulfide-1,4-benzoquinone) 172
 of CNT electrode 148
 of poly(5-amino-1,4-naphthoquinone) (PANQ) 168
 of poly(S-r-DIB) 147
 of poly-1,4-dimethoxybenzene 168
 of SF-CTF-1 164
 electrochemical properties of covalently grafted polysulfur-graphene nanocomposite 147
 of poly-1-amino-anthraquinone (PAAQ) 173
 of quinone-based polymers 168
 electron paramagnetic resonance (EPR) spectroscopy 23
 energy storage systems 129
 ethylviologen dianthraquinone-2-sulfonate (EV-AQ₂) 40
 exfoliated COFs (ECOFs) materials 185
 ex-situ solid-state ¹³C NMR for PIBN-G redox process 17
 extended viologen ((PyrPV)Cl₄) 117

f

- Fe-phthalocyanine cathode in primary Li batteries 129
 ferrocenes 127, 130–134
 flavins 25
 flexible textile-based all-polymer battery 251
 9-fluorenone (FL)-based NORFBs 260
 fluorinated porous triazine-based framework (FCTF-S) 164
 Fourier transform infrared spectroscopy (FTIR) 16–17

functionalized TMAP-TEMPO chloride 116

g

- galvinoxyl radicals 107
 graphene fiber electrode 237
 green TEMPO-based/zinc hybrid aqueous flow battery 120

h

- heteroaromatic-fused carbonyl compounds 37
 heteroatom-containing organosulfides 78–88
 hexaazatrinaphthalene-based polymers 192
 hexaazatrinaphthylene (3Q) 25
 2,4,5,7,9,10-hexathia-1,3,6,8 (1,4)-tetrabenzenacyclodecaphane (HTBCO) 74
 high-capacity Mg-Li hybrid battery 51

i

- imidazolium-grafted TEMPO 116
 imine materials, redox mechanisms of 25
 1,1'-Iminodianthraquinone (IDAQ) cathode material 39
 inorganic phosphate sulfides 88
 intermolecular cyclic polysulfides (ICPSs) 74
 ionic liquids 50

j

- Juglone/RGO hybrid electrode 42

k

- K₂-BDC anode materials 200
 K₂-BPDC/graphene composite electrode 206
 K-ion-based all-organic battery systems 248

l

- Li/2,2'-DpyDS cell 81
 Li₂-BDC 200
 Li/CF₃DPTtS cell 87
 Li-CP/HTBCO full cell 76

- Li-DANQ cell 38
 Li/diisopropyl xanthogen disulfide (DIXDS) cell 87
 Li/DPDSe-S cell 84
 Li/DPTS-Se cell 85
 Li/DPTtS@MSGC cell 91
 Li/DPTtS@VSGC cell 92
 Li/DPTtS@VSGC pouch cell 92
 Li₆-HAT electrode 206
 Li-ion carrier, for all-organic batteries 239–247
 Li/Li₂C₈H₄O₄ cell 200
 Li/P33DT cell 222
 Li/PEHS cell 77
 Li/pGPS cell 89
 Li/PhS-TePh cell 86
 Li/PMTT cell 79
 Li/Q-TTF-Q cell 94
 Li/SOPs cell 87
 Li/S/P-CTF@rGO cell 167
 lithiation mechanism
 of BQ1-COF 183
 for SPAN nanocomposites 160
 lithium 2,6-anthracene dicarboxylate (Li₂-ADC) 206
 lithium 4,4'-tolane-dicarboxylate (Li₂-TDC) 207
 lithium anthracene-9,10-bis [2-benzene-1,4-bis(olate)] (ABB4OLi) 241
 lithium-ion batteries (LIBs) 1, 35, 145, 199, 269
 advantages 6
 pyromellitic diimide dilithium salt 57
 quinone compounds for 36–41
 lithium metal batteries (LMBs) 1, 199
 lithium tetracyanoquinodimethan (LiTCNQ) 242
 lithium titanate (LTO) 199
 Li/TMTM cell 95
 Li/TPQD cell 95
- m**
- macrocyclic 2,5-difluorobenzene-1,4-disulfide (F-MCDS) 74
 magnesium ion batteries (MIBs), quinone as positive electrode material 50
 magnesium sulfur (Mg-S) battery 161
 metal-based all-organic batteries 229, 238
 Li-ion carrier 239–247
- Na/K ions carrier 248–250
 metal batteries, polymer cathodes 146
 metal-free carriers, for all-organic batteries 250–254
 metallically conductive bis(diimino) nickel framework 137
 metallocenes 127, 130
 metal organic frameworks (MOFs) 127
 1D 134–137
 2D 137–139
 3D 139–141
 2-methoxy-1,4-quinone (MQ)/MHQ redox pair, for RFBs 56
 Mg/CMS-PAn cell 163
 MIAcNH-TEMPO/Zn battery 116
 molecular engineering 116
 multifunctional TEMPO-grafted ionic liquid 109
- n**
- Na-CPP electrode 205
 Na-Fe₂(dobpdc) dual-ion battery 140
 Na/GPE/poly(S-PETEA)@ C cell 153
 Na-ion-based all-organic battery systems 248
 Na/Na₂-BPDC cell 204
 Na/Na₂-NDC cell 204
 naphthalene diimide (NDI) 58
 Na/PTVE-CNTs 190
 Na₂-PzDC electrode 209
 Na/TBBT cell 76
 N-containing active materials
 characterization methods 28–30
 redox mechanisms of
 azo materials 24–25
 conjugated sulfonamides 25
 imine materials 25
 nitroaromatic materials 25–27
 4-NHOCH₃-TEMPO/Zn flow battery 113
 4-nitrobenzoic acid lithium salt (NBALS) 218
 nitrogen-containing heterocyclic organosulfur compounds 78
 nitroxide radical polymers 186
 nitroxyl radicals 23
 non-aqueous all-organic redox flow batteries 260–264
 non-aqueous ORFBs (NORFBs) 255

- novel nonstoichiometric protonic ionic liquid (NSPIL) electrolyte 237
- n-type organic electrode materials 13
- n-type polyacetylene-based organic battery 239
- O**
- oligomeric cyclic organodisulfides 74
- 1D metal organic frameworks (MOF) 134–137
- organic anode
- azobisisobutyronitrile (AIBN) 217–220
 - conjugated carboxylates 200–213
 - aliphatic dicarboxylates 211–213
 - aromatic dicarboxylates 200–211
 - covalent organic frameworks 220–222
 - Schiff bases 213–217
 - thiophene compounds 222–223
- organic batteries 269, 271
- mechanisms 3
 - practical application 269
- organic cathode materials 35
- organic electrode(s)
- challenges 6–7
 - practical applications 6
 - solubility property 5
- organic electrode materials
- molecular structures 14
 - reaction mechanisms 14
 - of rechargeable batteries 13
- organic radical batteries (ORBs) 252
- organic radicals 101
- organic redox active material
- development 122
- organodisulfides 20, 68
- electrochemical performance 66
 - and theoretical capacities 66
- organometallic complex-based electrode materials
- metal-organic frameworks (MOFs) 134–141
 - small molecules
 - ferrocene 130–134
 - phthalocyanine complex 129–130
- organometallic complexes 127
- organopolysulfides
- basic 68–73
 - electrode materials 20
 - thiol-derived 73–78
- organosulfide(s)
- electrode materials
- characterization methods 21–22
- redox mechanisms 19–21
- heteroatom-containing 78–88
- selenium containing 82
- organosulfides battery 3
- organosulfur compounds 65
- organosulfur–inorganic hybrid cathodes 88–93
- organothiol(s) 74
- derivatives 73
 - in sodium battery applications 76
- organothiol-derived polymers 77
- oxidized indanthrone (oIDT) 40
- P**
- P3BT/CNTs composites 223
- paper-based all-polymer battery 251
- PBALS electrode 218
- pentakis-fused TTF derivatives 93
- perylene-3,4,9,10-tetracarboxylate (PTC) salts 206, 241
- perylene-based imide derivative 58
- 3,4,9,10-perylenetetracarboxylic dianhydride (PTCDA) 60
- phenazine materials, redox mechanisms of 26
- phenoxyl radicals 23
- 1,1'-(1,4-phenylene)-bis(perylene-3,4,9,10-tetracarboxylic dianhydride) 61
- 2-phenyl-1,4-naphthoquinone (PNQ) 55
- 3-phenyl-1,5-di-*p*-tolylverdazyl (PDTV) 112
- 2-phenyl-4,4,5,5-tetramethylimidazoline-1-oxyl 3-oxide (PTIO) 111
- 4-(1*H*-pyrrol-1-yl) phenyl ferrocenecarboxylate 130
- phenyl polysulfides synthesis 73
- phenyl selenosulfide (PhS-SePh) 82, 83
- phenyl tellurosulfide (PhS-TePh) 86
- phthalocyanine complex 129–130
- Pillar[5]quinone (P5Q) 50
- PMTT-derived sulfur/mesoporous carbon composite 79
- poly(2,2,6,6-tetramethylpiperidinyl-N-oxyl vinyl ether) (PTVE) 104
- poly(2,2,6,6-tetramethylpiperidinyloxy methacrylate) (PTMA) 186
- poly(2,2,6,6-tetramethylpiperidinyloxy-4-yl acrylamide) (PTAm) 253

- poly(5-vinyl-1,1,3,3-tetramethylisoindolin-2-yloxy) (PVTMIO) 106
 poly(anthraquinonyl sulfide) (PAQS) 170
 poly(benzo[1,2-b:4,5-b']dithiophene-4,8-dione-2,6-diyl) (PBDTD) 175
 poly(benzo[1,2-b:4,5-b']dithiophene-4,8-dione-2,6-diyl sulfide) (PBTDTS) 175
 poly(benzoquinonyl sulfide) (PBQS) 170
 poly(hexaazatrinaphthalene) (PHATN) 191
 poly(imide-benzoquinone) (PIBN) 183
 poly(sulfur-random-1,3-diisopropenylbenzene)
 (poly(S-r-DIB) 146
 poly(TEMPO-substituted norbornene) 104
 poly-(trypyridiniromesitylene) (PTPM) 254
 polyacrylic acid modified porous graphene oxide 88
 polyanhydrides 181–182
 poly(nitronylnitroxylstyrene) bipolar redox-active radical polymer 252
 polybithiophene (PBT) 222
 poly(S-TABQ) cathode 151
 poly-DAAQ-NT cathode 173
 poly(2,5-dihydroxyl-1,4-benzoquinonyl sulfide) (PDBS) electrodes 169–170
 poly(norbornene)-g-poly
 (4-methacryloyloxy2,2,6,6-tetramethylpiperidin-1-oxyl)
 (PNB-g-PTMA) 119
 polyimide-based all-organic sodium ion battery 250
 polyimide based COF materials 182
 polyimides 176–181
 polymer-based organic cathode materials
 carbonyl-derived polymers 167–182
 polyanhydrides 181–182
 polyimides 176–181
 polyquinones 168–175
 covalent organic frameworks-derived polymers 182–185
 hexaazatrinaphthalene-based polymers 192
 organic radical polymers 186–190
 organosulfur polymers
 covalent 163–167
 SH derived 154–157
 SPAN 157–163
 unsaturated bond 146–154
 triphenylamine-based polymers 190–191
 polymeric organic electrode materials 243
 polymerized CuDEPP cathode 128
 polyphenylene tetrasulfide (PPTS)-CNT electrode 155
 polyquinones 168–175
 porous LiMn₂O₄/carbon counter electrode 173
 porphyrin-based polymer cathode for Li storage 128
 potassium ion battery, PTCDA cathode material 60
 (PPBPy)Br₂/PSS-TEMPO all organic flow battery 114
 prelithiated PTCLi₆ battery 241
 proton batteries 231–238
 PTCDA, for all-organic Na-ion battery 250
 PTCDA/nitrogen-doped carbon/carbon nanotubes (PTCDA/NC/CNT) 250
 PTMA-based cathode composites 247
 PTMA-filled NCNTs cells 187
 PTMA-GO electrode 187
 PTMA-impregnated CNT composite electrode 104, 186
 PTMA-PS/Zn batteries 120
 PTMA/rGO composite 104
 PTVE-CNT composite 190
 PTVE/graphene nanocomposite cathode 105
 p-type organic materials 13
 pyrene-4,5,9,10-tetrone (PTO) 45
 pyridine-based bipolar materials, for NORFBs 262
 pyridine polysulfide 81
 pyrrolidinium cation functionalized TEMPO (Pyr-TEMPO) 117
 “p-π” conjugated acetylaminofunctionalized TEMPO 116
- q**
- quinone compounds
 for aqueous zinc-ion batteries 43
 for lithium ion batteries 36
 for metal-ion batteries 49–52
 quinone-ZTC electrodes 235

r

- radical for metal ion battery 102–109
 nitroxyl radicals 106–107
 other electrode materials 107
 PTVE radical 103–104
 TEMPO-based nitroxyl radicals 104–106
 radical materials
 characterization methods 23–24
 properties 101
 redox mechanisms 23
 radicals for redox flow batteries 109–122
 functionalization 110–114
 ionization 114–119
 radicals polymers 119–122
 TEMPO 109
 reaction mechanism of 1,4-bis
 (*p*-benzoquinonyl) benzene
 (BBQB) 16
 rechargeable lithium-organic battery,
 reaction mechanism of BBQB 16
 rechargeable organic batteries 3–4
 redox flow batteries (RFBs) 2, 254, 269
 redox mechanism(s)
 of aromatic dicarboxylates 201
 of conjugated sulfonamides 25
 of Li₂-NDC 205
 of Na-PD electrode 206
 of radicals 102
 of Schiff bases 216
 of TEMPO 103
 redox process, of PIBN-G electrode 17
 renewable Juglone biomolecules 42
 reversible electroactive organic systems 4
 reversible reaction mechanism of aqueous APh-NQ//Zn battery 47
 RIBOTEMPO batteries 114
 rocking-chair all-organic proton battery 235
 rocking-chair proton batteries 232

s

- Schiff bases 213–217
 Se-doped poly(diallyl tetrasulfide)
 (PDATtSSe) 151
 selenium containing organosulfides 82–85
 selenium-containing sulfur-rich
 copolymer cathode material 151
 selenium-doped PDATtSSe polymer 152

selenium nanowires, in DPTS-Se 85

- self-standing heteromat nickel
 2,6-naphthalenedicarboxylate
 (Ni-NDC) electrode 202
 Se-mediated DPDS cathodes 83
 SH derived organosulfur polymers 154–157
 Sn-(BDT)₂ complex 132
 sodium 1,10-phenanthroline-3,8-dicarboxylate (Na-PD) electrode 206
 sodium 4,4'-stilbene-dicarboxylate (Na₂-SDC) electrode 207, 208
 sodium-ion battery (SIB) 1
 with 3,4,9,10-perylene-bis
 (dicarboximide) 58
 PTCDA application 60
 solid polysulfides (SOPS) 87
 SPAN nanocomposite cathode materials 160
 S/P-CTF@rGO hybrids 167
 S-triallyl isocyanurate (STI) organosulfur polymer composite 149
 sub-zero temperature aqueous proton battery 234
 sulfur-containing heterocyclic quinone 37
 sulfurized polyacrylonitrile (SPAN) 157–163
 sulfurized-pyrolyzed polyacrylonitrile (S@pPAN) composite 163
 sulfur-limonene polysulfide (SLP) 149
 sulfur-rich thiazyl small molecules 40
 sulfur-rich vulcanized clay rubber (SRVCR) 150

t

- tellurium-doped SPAN composite 161
 TEMPO 108–109
 TEMPO-4-sulfate potassium salt 119
 TEMPO-based nitroxyl radicals 104–106
 TEMPO radical polymers 102
 TEMPO-substituted polynorbornenes 188
 tetra(allyloxy)-1,4-benzoquinone)₂-S₈
 ((TABQ)₂-S₈) 151
 tetraamino-*p*-benzoquinone (TABQ), for aqueous ZIBs 47
 2,3,7,8-tetraaminophenazine-1,4,6,9-tetraone (TAPT) 240

- 5,7,12,14-tetraaza-6,13-pentacenequinone (TAPQ) cathode material 48
- tetrachloro-1,4-benzoquinone (TCQ) cathode material 46, 52
- tetrachloro-*p*-benzoquinone 54
- tetraethyl thiuram disulfide (TETD) 22
- tetraketone (TDK) cathode material, for aluminum ion batteries 52
- tetrakis(methylthio) derivative (TTMD) solubility 93
- tetralithium 1,2,4,5-benzenetetracaboxylate ($\text{Li}_4\text{-BTC}$) 211
- 2,2,6,6-tetramethyl-1-piperidinyloxy (TEMPO)-based organic compounds 186
- 2,2,5,5-tetramethyl-2,5-dihydro-1H-pyrrol-1-oxyl-3-yl (PROXYL) radical 106
- 2,2,6,6-tetra methylpiperidin-1-yl)oxyl (TEMPO) 23
- tetramethylthiuram disulfide (TMTD) vs. tetraethyl thiuram disulfide (TETD) 68
- tetramethyl thiuram monosulfide (TMTM) 95
- 2,3,5,6-tetraphthalimido-1,4-benzoquinone (TPB) 39
- tetrapotassium 1,2,4,5-benzenetetracaboxylate ($\text{K}_4\text{-BTC}$) in potassium batteries 211
- tetrasodium 1,2,4,5-benzenetetracaboxylate ($\text{Na}_4\text{-BTC}$) 211
- tetrathiafulvalenes (TTFs) 93
- thianthrene 20
- thiol-derived organopolysulfides 73–78
- three dimensional (3D) Bode analysis 250
- 3D hybrid polymer composites cPpy-S-CTF 167
- 3Q reaction process, in lithium batteries 28
- TiS_2 NSs@ MWCNT network 90
- TMAP-TEMPO/BTMAP-Vi battery 116
- traditional all-organic batteries cell configuration 230–231
- proton batteries 231–238
- transition metal polysulfides 93
- transition metal sulfides 89
- Triazines 27
- trilithium 1,2,4-benzenetricarboxylates ($\text{Li}_3\text{-BTC}$) 210
- triphenylamine-based polymers 190–191
- tryptcene tribenzoquinone (TT) 39
- [3+3] truxenone (TRO)-based COFs 183
- 2D layered fluorinated CTF (FCTF) 220
- 2D metal organic frameworks (MOF) 137–139
- U**
- unsaturated bond-derived organosulfur polymers 146–154
- V**
- vanadium-based redox flow batteries 270
- vat dye/graphene composite material 38
- verdazyl radicals 107, 112
- vinyl group-functionalized reduced graphene oxide (V-rGO) sheets 147
- viologen anolytes, for pH-neutral AORFBs 258
- viologens 27
- VSGC cathode construction 92
- vulcanized polyisoprene (SPIP) nanowires 149
- Z**
- zinc perylenetetracarboxylates (Zn-PTCA) electrode 140, 141
- Zn (II) 5,10,15,20-tetrakis [(carbazol-9-yl)phenyl]porphyrin (Zn-mTCPP) 128
- Zn-HHTP cathode 138
- zwitterionic[(2-(methacryloxy)ethyl dimethyl-(3-sulfopropyl)] ammonium hydroxide 122

