

Index

a

active pharmaceutical agents 182
 alkyltrimethylammonium bromides (ATAB) 227
 alkyltrimethylammoniumchlorides 164
 amine-based surfactant-ruthenium(II) complexes 188
 2-aminobenzophenone with ethyl aceroacetate reaction 90–91
 aminoethyl-acetamide resorcinarene 235, 236
 amphiphiles 43, 46, 87, 117, 118, 159, 180–183
 amphiphilic block copolymers 108
 amphiphilic copolymer-based iridium catalyst 86
 amphiphilic Cu(II) complexes 147
 amphiphilic Ir metallosurfactants [$\text{Ir}(\text{ppy})_2(\text{dhpdbpy})\text{Cl}$] 95
 amphiphilic platinum–acetylidy metallocycle 228
 amphiphilic resorcinarene 235–239
 amphiphilic siderophores 226
 8-anilinonaphthalensulfonic acid (ANS) 254
 anionic surfactant 7, 21, 56, 89, 229
 anthropogenic emissions 195
 antibiotics 146, 180, 181
 antimicrobial ferrosurfactants 181
 antimicrobial peptides (AMP) 184, 185
 apolar solvent medium environment 49
 atomic force microscopy 44, 261

atom transfer radical polymerization (ATRP) 57

Auranofin 179

b

bacteria, MTS effective against 181
 bacteriocin 185
 bimetallic composites 239
 biologically active metal complexes 179
 biomedical applications 146, 150, 151, 198, 224–227
 biomodal nanoparticulate contrast agent fabrication 110
 biphasic redox reaction 169–171
 (2E)-3-biphenyl-4-ylprop-2-en-1-yl acetate 54
 2,2-bipyridine (bpy) 28
 biscetylpyridiniumtetrachloroplatinate (Pt-CPC) 30, 186
 bis(*p*-nitrophenyl) phosphate (BNPP) hydrolysis 74
 bis-*p*-(nitrophenyl)phosphate 232
 2,6-bis(*N*-triethyleneglycolbenzimidazol-2-yl)-pyridine 229
 bis-(4-pyridylmethyl hexadecanoate)-(1,4,7-triazacyclononane) copper(II) complex 148
 bis(terpyridine)ruthenium complex 43
 bistable copper metallosurfactants based molecular machine 122
 β-nitration 256
 bolaform/gemini surfactant 34

- bovine serum albumin (BSA) 106, 227, 258
- breast cancer MTS effective against 186–189
- Brewster angle microscopy (BAM) 35
- Brust Schriffin method (BSM) 56
- C**
- calcination process 121, 127
- carbon dot-metallocsurfactant contrast agent 110
- carbon monoxide (CO) 195–208
- carboxyhemoglobin (COHb) 195
- carboxylate derivatives of resorcinarene (CRA) 236
- carboxylate esters, catalytic hydrolysis of 65–70
- Carboxypeptidase A 63
- cardiovascular system 198
- catalysis, chemistry of 50, 51
- interfacial catalysis 56–58
 - micellar catalysis 51–53
 - vesicular structures, in catalysis 53–56
- catalytic hydrolysis
- of carboxylate esters 65–70
 - of phosphate esters 70–76
 - of PNPA 68, 70
- catenanes 119, 120
- cationic antimicrobial peptides (CAMP) 184, 185
- cationic metallocsurfactants 35, 181
- cationic surfactants 182
- antibacterial and antifungal properties 183
- cetyltrimethylammonium bromide 86
- cell metabolism 198
- CESTO-CuMCM-41 121
- cetylpyridinium chloride (CPC) 30, 92, 145
- cetyl trimethylammonium bromide (CTAB) 86, 95, 165, 254
- cetyltrimethylammonium ferrate (CTAF) surfactant 126
- chelated cisplatin for anticancer therapy 186
- chelation theory 183
- chemical methods, for genetic material administration 136
- chemical swarming 187
- chemosensors 251–253
- chronic obstructive pulmonary disease 199
- cis*-[Co(trien)(C₁₄H₂₉NH₂)Cl] (ClO₄)₂ metallocsurfactant, cytotoxic activity of 139
- cisplatin 185
- cisplatin-coordinated oligomers 186
- C_n-Cu-C_n-based metallovesicles, aggregation behavior of 103
- cobalt (III)-based metallocsurfactant 103
- cobalt based phenolate metallocsurfactants 93
- cobalt containing Schiff bases 183
- cobalt soap 125
- Co (II) based metallocsurfactant 92
- Co(III) cyclen complexes 189
- COHb concentration 198
- colloidal synthesis 161–166, 168
- co-micellar effect, for Zn²⁺ and Cu²⁺ complexes 66
- composite surfactant 46
- coordination sphere 27–29, 200
- copolymerization of, styrene 58
- copper-based metallocsurfactant complex 104
- copper (Cu)-CTAB metallocsurfactant based nanovector 107
- copper metallocsurfactant 40, 47, 121–123
- copper surfactant 31, 58, 122
- CO releasing aggregates (CORAs) 202
- CO-releasing metallocosomes 106
- co releasing metallocsurfactants mixed CORA, properties 205–207
- molybdenum-based CORMS 204–205
- CO releasing molecules (CORMs) 199
- counterion binding 23
- critical aggregation concentration (CAC) 94, 249

- critical micellar concentration (CMC) 2, 4, 120, 139
 critical micelle concentration (CMC) 21, 25, 33, 181, 226, 249
 cross-coupling reaction 89, 91, 239
 CTAC-Cu(II) C₁₂CESTO mixed micelles 121
 Cu-based metallosomes, in DNA vaccine delivery 106
 cucurbituril molecule 233
 CuO-NiO/SiO₂ for nitrophenol reduction 123
 CuO/SiO₂ for nitrophenol reduction 123
 cyclodextrins (CDs) 43, 136, 229
 2-cyclohexene-1-one 54
 cylindrical micelles 43, 44
 cytoprotective agent 197
 cytotoxic activity, of cobalt complexes 186
 cytotoxicity assays, in HEK293 cell line 150
- d**
- decenyl resorcinarene 237
 decyl-glycylglycine (GlyGly) 254
 decyl resorcinarene 237
 degradation of methylene blue 126
 degree of, micelle ionization 23
 Diels Alder reaction 87
 diethyldiallylmalonate (DEDAM) 52
 dihalogenated hydrocarbon compound 204
 dimethyl(phenyl)silane 54
 dinuclear copper complexes 70
 dispersion polymerization 52
 distearoylphosphatidylcholine (DSPC) 252
 1,2-distearoyl-*sn*-glycero-3-phosphocholine 232
 DNA condensation 137
 DNA-surfactant complexes 138
 DNA transport studies 106
 dodecylammonium bromide surfactants 25
- 4-dodecylbenzenesulfonic acid (4-DBSA) 56
 double chained MTS 7
 drug delivery, pH-responsive mesostructured surfactant silica hybrid 108
 drug sphere 200
 dual functionality, of metallosurfactants 117
 dual porosity 122
 dynamic light scattering 205
 dynamic metallosupramolecular amphiphiles 229
- e**
- electron microscopy 48
 enthalpy, of micellization 23
 entropy, of micellization 23
 entropy of, micellization process 24
 esterolytic reactions, metallosurfactant nanocatalyst for 64
 excimer-monomer equilibrium 252
- f**
- Ferrum laurate [Fe(OOCC₁₁H₂₃)₃] metallosurfactant 48
 fetal bovine serum (FBS) 258
 fluorescence sensing applications 251
 fluorinated surfactants 258
 Fourier transform infrared spectroscopy (FTIR) 207
 free-metal prodrugs 201
 free Mo-CORM 207
 fungus, MTS effective against 182
- g**
- gasotransmitter 198
 Gd (III) based MRI contrast agents 110
 Gemini surfactants 70
 gene therapy 135
 gene transfection process 137
 Gibbs adsorption isotherm equation 24
 Gibbs energy, of micellization 23
 Gibbs-Helmholtz relation 24

h

halosulphonated compound 204
 H-bond chelation 44
 heme oxygenase (HO) 196
 hepcidin (Hpc-25) 185
 hexadecylpyridinium Chloride 163
 hexadecylpyridinium trichloro cobaltite [CoCPC(I)] 92
 HIFU responsive process of Cu(II)-Terpyridine bonds containing block copolymer micelles 108
 high melting explosive (HMX) 252
 Histatin-5 (Hst-5) 185
 hollow polymer nanocontainer 238
 hybrid metal-based surfactant 7
 hybrid nanoplatforms 223
 hybrid nanostructured materials 223
 hydrodynamic radius (R_h) 45, 48
 hydrogen bonding 31
 hydrogen bonds 201
 hydrogen evolution reaction (HER) 84
 hydrolytic metallosurfactant 65
 hydrophilic head group, metal ion in 7
 hydrophobicity, of cobalt (III)-based metallosurfactant 103
 hydrophobic resorcinarenes 235
 hydrophobic tail group, metal ion in 7
 1-(2-hydroxytetradecyl)-1,4,7,
 10-tetraazacyclododecane 40
 1-(2-hydroxytetradecyl)-1,4,
 7-triazacyclononane 40
 hypoxic effect 195

i

idiopathic pulmonary fibrosis 199
 imidazole-based ligands 74
 imidazole based metallosurfactant ligands 65, 66
 imidazole propanamide based ligand 75
 inorganic surfactants (I-SURFs) 6
 inter and intramolecular Diels–Alder reaction 201
 iodobenzene 58, 239
 ionic reactants 50

IPr (NHC ligand) 89
 iridium metallosurfactant–porphyrin film 232
 isoctane 162

l

lactonization of 5-(het)arylpent-4-ynoic acids 54
 Langmuir–Blodgett (LB) films 34, 93
 Langmuir monolayers 35, 51, 232
 Langmuir–Schaefer technique 232
 lanthanide metal complexes 76
 lanthanum nitrate 234
 lauroylsarcosine 230
 Lewis acid-surfactant-combined (LASC) catalysts 91
 ligand insertion reaction (LIR) 10
 ligand substitution reaction (LSR) 9
 light driven hydrogen generation 95
 light-sensitive ruthenium (II) polypyridyl complexes 186
 linear alkyl methyl ketones 53
 lipid bilayer conformation 47
 lipophilic Cu(II) complexes 148
 lipophilicity of metal complexes 183
 lipophilic systems 261
 liposomes 147
 liquid crystal template efficacy of ruthenium-based surfactants 125
 low-polarity solvents 261
 lung cancer, MTS effective against 189

m

macrocyclic hexamine ligands 233
 macrocycle–metallosurfactant systems 240
 macrocyclic materials 223
 macrocyclic scaffolds 227
 macroporous silica based material 118
 magnetic resonance imaging 39, 103,
 117, 160, 180
 manganese(III) *meso-p*-tetracarboxylatoporphyrinate (TCPP) 261
 marinobactins 46

- mesoporous silica based material 118
 metal-carbonyl complexes 199
 metal chelated surfactant complex 129
 metal containing Schiff base amphiphilic complexes 189
 metallic and bimetallic oxide SiO_2 material 123
 metalloamphiphiles 233, 234
 metallocomplexes 227
 metallocycle voids 251
 metallodendrimers 201
 metalloenzymes 63
 metalloliposomes (mettosomes) 147
 metallomacrocycles 235
 metallomicellar catalysis 85
 metallomicellar systems 227
 metallomicelles 226
 metallosomes
 as drug delivery agents 105–107
 using complex
 (1,2-diaminocyclohexane)
 platinum (II) (DACHPt) 106
 metallosurfactant CORM (MTS-CORM) 202
 metallosurfactants (MTS) 3, 63, 103, 249–250
 adsorption of, surfactant monolayers 34–36
 advantages 83
 amphiphilic system 227–230, 232–235
 characterization of 11
 classification 63
 classification of 6–8
 and detection protocol 255–258, 260–262
 intrinsic physiognomies 3–6
 ligand insertion reaction 10
 ligand substitution reaction 9–10
 metal ion effects 4
 metal surfactant complexes
 category I complexes 24–29
 type II complexes 29–31
 type III complexes 31–34
 metathesis reaction 8–9
 micellization and surface parameters 22, 23
 adsorption parameters 24–34
 thermodynamics of micellization 23–24
 as MRI contrast agents 109
 as nanocatalyst for esterolytic reactions 64
 nanosized containers 251
 one-stage synthesis of 225
 quantitative treatment of observed rates 77
 self-assembled moieties 253–255
 solvent system effects 4
 structural factor effects 4
 structure of 64
 surfactant aggregates 252–253
 two-stage synthesis of 226
 metallosurfactants-organic catalysed reactions 85
 Diels Alder reaction 87–88
 N-heterocyclic carbenes 88
 oxidation reactions 87
 stimuli responsive catalyst 90
 transfer hydrogenation reaction 86–87
 metallotectons 235
 metallovesicles
 metal carbonyl metallosurfactant,
 supramolecular rearrangement of 105
 using amphiphilic
 bis-(4-pyridylmethyls
 hexadecanoate)
 (1,4,7-triazacyclononane) copper (II) triflate 106
 metal-modified nanocontainers 240
 metal nanoparticles (MNPs) 235
 metal-oleylamine complex 168
 metal surfactant structures 225
 metathesis reaction (MR) 8
 methylene chloride 201
 methyl methacrylate (MMA) 256
 micellar sodium dodecyl sulphate (SDS) system 252
 micellar systems 207

- micelle forming molecule 203
 micelles 2, 22
 micro/nanoscale molecular machine 120
 microporous silica based material 118
 mitochondrial dysfunction 201
 mixed ligand coordination complexes 8
 Miyaura–Michael reaction 54
 Mizoroki–Heck reactions 58
 molecular machines (MM) 119
 molybdenum based metallomicellar catalyst 87
 molybdenum carbonyl metallosurfactants 224
 molybdenum metallosurfactants, aggregation behavior of 105
 molybdenum nanoforms 201
 molybdenum nanoparticles 200
 molybdenum tetracarbonylic metallosurfactants 205
 monodisperse vesicles 46
 monomer concentration 35
 monometallic nickel Ni-p(MVCA-St) 239
 MRI contrast agents 109
 biomodal nanoparticulate fabrication 110
 carbon dot-metallocsurfactant CA 110
 Gd(III)-based metallocsurfactants 109
 multifunctional liposomal systems 227
- n**
 nanocrystals 166
 nanomaterial based assemblies 105
 nanoparticles (NPs) 160
 nanovectors 107
 naphthoquinonesulfonate (NQS⁻) 261
 N-heterocyclic carbene (NHC) based metallocsurfactant (MS) 50
 metallocsurfactant 57
 metallocsurfactant catalysed reactions 88
 N-hexadecylmethylenediamine silver nitrate complex 165
- Ni (II) complexed with anionic Schiffs base amphiphiles 184
 NiO/SiO₂ for nitrophenol reduction 123
 Ni surfactant 25
 non-covalent interactions 240
 non-emissive [Ru(tpy)(bpy)Cl]Cl complex 188
 nonionic Schiff bases, antibacterial and anti fungal activities 184
 non-ionic surfactant 127, 128
 non-viral vectors for gene therapy 139
 NPs fabrication 161
 nucleophilic substitution 204
- o**
 1-octene, hydroformylation of 91
 1-octylamine 96
 organic bolaform disulfonate 34
 organometallic surfactants 8
 Overtone's theory 183
 oxidation reactions 87
 oxygen evolution reaction (OER) 84
- p**
 p(CRA-B) 237
 palladium complexes 27
 Pd–carbene bond 50
 Pd²⁺–o-phenylenediamine fragments 228
 PDT chemotherapy 187
 pentacarbonylic (PCO) compounds 205
 pentafluorophenyl 256
 phase separation model 77, 78
 phase transfer catalysts (PTC) 50
 phenanthroline 138
 1,10-phenanthroline (phen) 28
 phenanthroline based novel ligands 68
 phenylboronic acid 239
 phenyl-p-benzoquinone 261
 5-[4-(trifluoromethyl)phenyl]pent-4-yneic acid 54
 phosphate esters, catalytic hydrolysis of 70
 phosphatidylcholine (PC) 205
 photocatalytic H₂ evolution 95

- photocatalytic water splitting mechanism 95
 photochemistry 186
 photosensitizer (PS) 57
 pH-responsive mesostructured surfactant silica hybrid, for drug delivery 107
 physical methods, in genetic material administration 135
 Pincer complexes 53
 Piscidins 184
 pluronic F127-Zn-R8-FITC coordination complex 108
p-nitrophenol 238
p-nitrophenyl diphenylphosphate (PNPDPP) 65, 70
 polyaromatic compounds 251
 poly(methyl methacrylate) (PMMA) colloids 58
 polyethylene glycol (PEG) 199
 polyethyleneglycol ubiquinol sebacate (PQS) 51
 polyfunctional nanosystems 240
 polymer-colloidal systems 227
 polymeric micelles 108
 polymer-metal complex micelles (PMCM) 108
 polymer nanocontainers 236
 polymer-protein system 201
 porous silica based material 118
 anganese modified mesoporous silica 128
 future prospective 129–130
 magneto-responsive mesoporous silica 126–128
 surfactants based porous material 124–125
 surfactants based porous materials 121–124
 synthesis procedure 120–121
 precursor surfactants 227
 pseudo-double chain surfactant (PDCS) formation 4
 Pseudogemini metallosurfactants 8
 Pt-based surfactants, cytotoxic assays of 144
 Pt metal coordination 47
 pyridine aldoxime ligand 72
 pyridine-based ligands 74
 4,4'-(dialkylamino) pyridine based ligands 72
 pyridine based metallosurfactants 72
 pyridine-based surfactant ligands 67
- q**
 quantitative rate metallosurfactant treatment, kinetic models for 77
 quinoline based amphiphilic ligand 255
- r**
 resorcinarenes 235
 ring-closing metathesis 51
 ring-opening metathesis polymerization (ROMP) 51
 royal demolition explosive (RDX) 252
 Ru-based metalloliposomes 149
 Ru(III) based metallosurfactant
 [$\text{Ru}(\text{bipy})(4,4'\text{-diheptadecyl-2,2'\text{-bipyridyl})}_2\text{Cl}_2$] 104
 Ru-based metallosurfactants 139
 RuC11C11/cyclodextrin complexes 140
 RuC19C19/cyclodextrin complexes 143
 RuC19C19/DNA complexes 143
 RuC11C11 surfactants 142
 RuC19C19 surfactants 142
 [Ru(bpy)₃] metallomicellar system, anticancer activity of 107
 Ru metallosurfactants 45
 Ru(II) metallosurfactants 143–144
 Ru(II)-polypyridyl hydrophilic 48
 Ru surfactants 44
 ruthenium based polypyridyl complex 187
- s**
 sarcophagines 121
 scandium tris(dodecyl sulfate) [Sc(DS)₃] 90
 Schiffs base cationic surfactants 183

- selected area electron diffraction (SAED) pattern 166
- self aggregation behavior inverted micelles 44–45 lamellar phases 49–50 micelles 40–44 vesicles 46–49
- self-assembly 120 of lipophilic Cu(II) complexes 148 magnetic mesoporous silica synthesis 126
- self-assembly of metallo-supramolecule based block copolymers 108
- single atom catalyst (SAC) 127
- single chained MTS 7
- single iron atom loaded mesoporous silica 127
- single-photon emission tomography 227
- small angle neutron scattering (SANS) 40
- small angle X-ray scattering (SAXS) 40
- sodium dodecanoate (SD) 229
- sodium dodecyl benzenesulphonate 166
- sodium dodecyl sulfonate (SDS) 229
- sodium molybdate 227
- sodium tungstate 227
- soft supramolecular nanocontainers 223
- solid lipid Nps and copper-cetylpyridinium chloride surfactant 122
- solvatochromic effect 235
- solvatochromic properties 261
- spherical metallosomes 150
- standard free energy, of micellization value 227
- stem cell regulation 198
- stimuli responsive metallosurfactant catalysed reactions 90
- superamphiphilic complexes 235
- supramolecular aggregation 203, 233
- supramolecular-based copolymer micelles 108
- supramolecular nanocontainers 236
- supramolecular systems 205
- supramolecular transformation 46
- surface chemistry 1
- surfactant-Co (III) complexes 189
- surfactant molecules 22
- surfactants 103, 179 defined 1 schematic representation 2
- surfactants based porous material 124–126
- Suzuki cross-coupling reaction 239
- Suzuki–Miyaura reactions of aryl bromides 91
- Suzuki reaction 239
- synthetic amphiphilic receptor 232
- t**
- target-based cancer therapy 189
- template based synthesis, of porous silica based material 120
- terminal carboxylate moieties 46
- ternary complex kinetic model 77
- terpyridine-containing double hydrophilic diblock copolymer 109
- tertradentate ligand 73
- tetraanionic porphyrin 232
- tetrabutylammonium 260
- tetracarbonylic (TCO) compounds 205
- tetradecylpyridinium (TP) based metallosurfactants 30, 31
- tetradentate ligand 73
- tetraethylorthosilicate (TEOS) 255
- thermal decomposition 168, 169
- thiazole/imidazole group 262
- thioether-cholesterol ligand 186
- transfection processes 151
- transfer hydrogenation reaction 86
- tributylphosphine (TBP) 166
- tributylphosphine oxide (TBPO) 166
- trinitrophenylmethylnitramine (tetryl) 252
- trinitrotoluene (TNT) 252
- triocylphosphine oxide (TOPO) 166
- tris-bipyridyl ruthenium hexaphosphate 261
- true liquid crystal templating (TLCT) approach 124

- two alkyl chains 6 carbon atoms (TCOL6) 205
type II I-SURFs 6
type I I-SURFs 6
- U**
ultrasound responsive
metallo-supramolecular diblock PPG-PEG copolymers 108
- V**
Van der Waals interactions 31
vesicular catalysis 91
- vesicular shaped Co (II) based metallosurfactants 94
vigorous stirring, of emulsion 58
- W**
water electrolysis 84
water/methyl methacrylate (MMA) emulsion 57
water oxidation, metallosurfactant catalyst in 91
water/proton reducing catalyst (WRC) 57
water-soluble monomers 52

