

Index

a

- acetic acid 259
 acetoacetamide 206
 acetyl thiourea chitosan polymer (ATUCS) 63
 acidization 126
 acid producing bacteria (APB) 306, 307
 acrylamide polymer 270
 acrylate polyol 146
 acrylic acid (PVCap-co-Na AA) 171, 176
 adsorbed water molecules 244
 adsorption isotherms 243–245
 adsorption process 246, 356
 aerobic iron oxidizing bacteria 307
Albizia ferruginea (AF) 41
 aldehydes/carboxylates-based inhibitor 393
 alginate 231, 271–272
 alkaline modified starch (AMS) 103
 allyl sulfonate graft chitosan (CH(S)) 28
 α -l-guluronic acid 5, 233
 aluminum 109
 amidoamine ammonium salts 166
 aminated hydroxyethyl cellulose (HEC) 33
 amine-based inhibitor 392
 amino-mercapto triazole 13
 aminosulfonic acid 82
 aminotriazolethiol-modified chitosan (ATT-Cht) 64
 anodic and cathodic processes 99, 243

- anodic dissolution process 83
 anodic inhibitors function 165, 166
 anodic Tafel segments 25
 anti-agglomerants (AAs) 163
 anti-agglomerates (AA) 167
 anti-corrosive additive 81
 antifreeze proteins (AFPs) 169
 aqueous alkaline media 238
 aqueous extract (AE) 273
 arabinogalactan (AG) 104
 aramids 111
Araucaria columnaris 40
 aromatic polyamides 111
 arsenic and selenium species 310
 as-synthesized green macromolecules 84
 atomic force microscopy (AFM) 25, 28, 113, 354, 369
Azadirachta indica gum 40
 azomethine ($-\text{CH}=\text{N}$) linkage 10
Azotobacter 169

b

- benzaldehyde (CSB-1) 10
 benzenoid–quinonoid ring's distinctive band 108
 benzylidemethyl-dodecylammonium chloride 311
 β -cyclodextrin 270
 β -Cyclodextrin modified natural chitosan 30

- β -D-mannuronic (D block) acid 233
 β -D-mannuronic acid (M) 5
 bimetal corrosion 337
 bio-corrosion 305
 biodegradable corrosion inhibitor 132
 biofilms 307
 biopolymer-based corrosion inhibitors 4
 biopolymer dextrin-based graft copolymer (Dxt-g-pVAc) 65
 block copolymer 152
 branched poly- α -D-glucoside 212
 butyl derivatives (ethyl-butyl and methyl-butyl combinations) 172
 butyric acid 307
- C**
- carbohydrate polymer 4, 57, 58
 emerging trends 59
 carbohydrate polymer-nanoparticle composites 67–68
 grafted polymer 65–66
 heterocyclic compound modified 62–64
 PEG cross-linked polymer 66
 polymer-based surfactant 66
 Schiff bases 59, 61–62
 synergistic effect of, salts/surfactants 68–73
 limitations, as anti-corrosive material 58
 carbohydrate polymer-nanoparticle composites 67–68
 carbohydrates (CHO) 4, 263–264
 alginate 271–272
 carrageenan 269–270
 cellulose 265–268
 dextrin 270–271
 exudates' fluids 269
 pectin 268–269
 starch 264–265
 carbonate formation 126
 carbon dioxide (pCO₂) 196
 carbon-manganese (C-Mn) steel 264
- carboxy betaine (CB) 286
 carboxyl-acid-group-modified PVCap 168
 carboxymethyl cellulose (CMC) 6, 33, 67, 69, 206, 267
 carboxymethyl cellulose/silver nanoparticles composite (CMC/AgNPs) 35, 131
 carboxymethyl chitosan 27, 29
 3-carboxypropionamide 206
 carrageenan 269–270
 cashew tree gum (CTG) 40
 cathodic corrosion 195
 cathodic effect 82
 cathodic precipitates 195
 cathodic predominance 205
 cathodic protection 342
 cathodic reaction 244
 cathodic Tafel segments 25
 cationic gemini surfactant inhibitor 311
 cavitation corrosion 229
 cellulose gum (CG) 206, 267
 cetrimonium nalidixate 311
 cetyl pyridinium chloride (CPC) 69, 283
 cetyltrimethylammonium bromide (CTAB) 36, 264
 chemical adsorption 3
 chemical corrosion
 CO₂ corrosion 339–340
 H₂S corrosion 339
 oxygen corrosion 340–341
 chemically modified hydroxyethyl cellulose (CHEC) 35
 chitosan 5, 29, 271
 chitosan-4-amino-5-methyl-1,2,4-triazole-3-thiol (CS-AMT) 30
 chitosan anisaldehyde Schiff base (CTBH) 27
 chitosan cinnamyl aldehyde Schiff base (CTBR) 27
 chitosan citral Schiff base (CTBN) 27
 chitosan ionic liquid polymers 30

- chitosan-*p*-toluene sulfonate salt (CSPTA) 30
- chitosan Schiff bases 10
- chitosan vanillic aldehyde Schiff base (CTBS) 27
- chondroitin sulfate (CS) 104
- cinnamaldehyde 12, 63, 112, 129, 272
- commercially isolated soy polymer (CIP) 273
- compound annual growth rate (CAGR) 56
- contact angle measurements 354
- conventional corrosion prevention methods 341
- alloyed steel (stainless) 341–342
- cathodic protection 342
- fusion bonded epoxy (FBE) coating 343
- galvanic coatings 342
- polyolefin coatings 342–343
- tar coatings 341
- corrosion 2, 24, 161, 221
- adsorption and inhibition, mechanism of 214–215
- cavitation corrosion 229
- classification of 384
- crevice and pitting corosions 384
- fretting and erosion-corrosion 384–385
- SCC 384
- uniform corrosion 385
- computational modelling of, polymeric inhibitors 212–213
- control strategies 56–57
- corrosion inhibitors 195
- crevice corrosion 226
- economic impact 194
- and economic significance 2
- erosion 228
- factors affecting 236
- absorption isotherm models identification 243–246
- corroding environment 237–242
- corrosion mechanisms 242–243
- electrochemical measurements 246
- nature of, metal 236
- fretting 228
- galvanic corrosion 225
- general and local electrochemical corrosion 226
- influence of, on economy sector 221–222
- intergranular corrosion 227
- mechanism 244
- metal corrosion, reasons 222
- of metallic structures 16
- pitting corrosion 227
- polymers as, sweet CI literature survey of 205–211
- modified polymers 212
- significance of 205
- prevention and protection, of metals 230–231
- green polymeric inhibitors, Al metal dissolution 230–231
- natural polymers 231–235
- reactions of, Al in alkaline media 229
- social and economic issues 55
- stray current corrosion 228–229
- stress corrosion cracking 228
- sweet corrosion
- CO₂ corrosion, mechanism of 195–196
- key parameters 196–197
- survey of literature 197–199
- theories of 222
- electrochemical theory 223–224
- types of 224–225
- uniform corrosion 225
- corrosion inhibition of Schiff bases (CSBs) 136
- corrosion inhibitor (CI) 1, 2, 163–167, 385–386
- adsorption and protection mechanism 14–16

- corrosion inhibitor (CI) (*contd.*)
- biopolymer
 - composites 14
 - importance of 4–5
 - nanoparticles 13
 - chemically modified biopolymers
 - 10–13
 - green corrosion inhibitors 2–3
 - management 393–394
 - assurance of corrosion inhibitor 397–398
 - corrosion inhibition test/validation program 394–396
 - identify application window 394
 - implementation and surveillance of 398
 - selection of, corrosion inhibitor 396–397
 - polysaccharides as 4–7
 - proteins and polyamino acids 7–10
 - sour corrosion inhibitor 386
 - amine-based inhibitor 387–388
 - gemini surfactants-based inhibitor 388–390
 - imidazoline -based inhibitor 388
 - polymer -based inhibitor 390
 - sweet corrosion inhibitor 390–391
 - aldehydes/carboxylates-based inhibitor 393
 - amides/amido-based inhibitor 392
 - amines-based inhibitor 392
 - imidazolines-based inhibitor 391
 - corrosion inhibitor formulation (CIF) 199
 - corrosion potential (E_{corr}) 100
 - corrosion rates 235–236
 - corrosive stress cracking (CSC) 339
 - crevice corrosion 226
 - cross-linked poly (N-alkyl-4-vinyl pyridinium) iodides 32
 - cryo-scanning electron microscope (SEM) 168
 - cyclic loading 228
- d**
- Daniella Oliverri* (DO) gum 40
 - degree of surface coverage (θ) 244
 - delta-proteobacteria 306
 - denaturing gradient gel electrophoresis (DGGE) 308
 - density functional based tight-binding (DFTB) 154
 - density functional theory (DFT) 134, 154, 213
 - deprotonating constant 232
 - dextran 212
 - dextrin 38, 270
 - D-galactopyranose unit 6
 - D-glucose monomer 270
 - diallyldimethylammonium chloride (DADMAC) 289
 - dibutyltin dilaurate (DBTL)-catalyzed reaction 348
 - dicyclopentadiene (DCPD) 348
 - Diels-Alder reaction 348
 - diester functional groups 103
 - differential pulse anodic stripping voltammetric (DPASV) 283
 - differential pulse polarography (DPP) 283
 - (micro) differential scanning calorimetry (DSC or μ -DSC) 175
 - diffusion controlled reaction 364, 365
 - d-orbital atoms 213
 - dual-function inhibitor 173
 - dual purpose chemicals 170
- e**
- El-Awady isotherm model 359
 - El-Awady kinetic-thermodynamic adsorption isotherm model 107
 - electrical MIC (EMIC) 306
 - electrochemical corrosion
 - corrosion, due to galvanic reaction 337
 - pitting corrosion 337–338

- electrochemical frequency modulation (EFM) 113, 353, 365
- electrochemical frequency modulation trend (EFMT) 353, 365
- electrochemical impedance spectroscopy (EIS) 33, 99, 353
- electrochemical polymerization 279
- electrochemical protection 342
- electrochemical techniques
- electrochemical impedance spectroscopy 361–362
 - open circuit potential curves 360
 - potentiodynamic polarization 362
 - kinetics of corrosion 363–365
 - electronegativity 4
 - electron-rich substituents 166
 - emulsification process 346
 - energy-dispersive X-ray spectroscopy (EDX) 25, 368
 - energy of highest occupied molecular orbital (E_{HOMO}) 134
 - energy of lowest unoccupied molecular orbital (E_{LUMO}) 134
 - erosion corrosion 228
 - essential oil 262
 - tannins and flavonoids 262–263
 - terpenes and isoprene 262
 - (poly) ethylene glycol (PEG) 138
 - extracellular polymeric substances (EPS) 305, 306, 307
 - extrusion 343
- f**
- fast corrosion processes 235
- film-free condition 197
- fireproofing fabrics 234
- flammable/explosive fuel gases 176
- flavonoids 262–263
- fluorescence in-situ hybridization (FISH) 308
- formaldehyde linkage 272
- Fourier transform infrared spectroscopy (FTIR) 103, 269, 375–376
- fretting corrosion 228, 384
- friction corrosion 384
- frontier molecular orbital energies 4
- furfurylamine 89
- fusion bonded epoxy (FBE) coating 343
- g**
- Gallionella* sp. 307
- galvanic cell 223
- galvanic coatings 342
- gas chromatography-mass spectroscopy (GCMS) 269
- gas hydrate 162, 167
- formation 173
- gas hydrate and corrosion inhibitors (GHCIs) 170–173
- factors controlling performance 176–179
- chain length specific 177
 - charge distribution 177
 - operational conditions 179
 - size/molecular weight 176–177
- mechanism of action of 173–175
- performance testing and evaluation 175–176
- gasometric methods 244
- gemini surfactants 103
- geometrical configuration 234
- glucosyloxyethyl acrylate graft chitosan (GA-CHS) polymer 28
- glutamic acid 80
- glycerin-grafted starch 36
- glycosidic bonds 264
- graft copolymerization 84
- graphene oxide (GO) 28, 277
- gravimetric technique 100
- green corrosion inhibitors 3, 311
- green inhibitors 169
- gross domestic product (GDP) 55
- Grubbs' catalyst 348
- Guar gum (GG) 6, 39, 269
- Guar gum and methylmethacrylate (GG-MMA) composite 212

- gum acacia (GA) 6, 69
 gum Arabic and silver nanoparticle composite (GA-AgNPs) 68
- h***
 halloysite nanotubes (HNTs) 348
 heteroatoms 162
 heteroatoms-based functional groups 166
 heterocyclic molecules 13
 heteropolymeric sequences (MG-blocks) 233
Hevea brasiliensis 262
 2-hexamethylene diisocyanate 348
 hexauronic acid residue 233
 high dosage hydrate inhibitors (HDGIs) 167
 highest occupied molecular orbital (HOMO) 101, 135
 high molecular weight fraction (HMWF) 273
 high-temperature polymeric corrosion inhibitors
 computational studies 134–138
 naphthenic acids environment 133, 134
 oil well acidization 126, 127, 129–131
 sour and sweet environment 131, 132, 139
 hollow fibers 345
 honeycomb Al alloy bipolar plate membrane 284
 hydrate formation 154
 hydrochloric acid (HCl) 126
 hydrofluoric acid (HF) 126
 hydrogen (H₂) gas 25
 hydrogen-gas evolution (Gasometric technique) 235
 hydrophilicity 234
 1-hydroxyethane-1,1-diphosphonicacid-Zn²⁺ binary system 35
 hydroxyethyl cellulose (HEC) 5–7, 33, 69, 173
- 4-hydroxy-3-methoxy benzaldehyde (CSB-3) 61
 hydroxypropyl cellulose (HPC) 33, 108
 hydroxypropyl methylcellulose (HPMC) 33
 8-hydroxyquinoline-based chitosan 62
 hygroscopic spray-dried powder 206
 hyperbranched poly(ester amide)s 168
- i***
 imidazoline 172, 310, 388, 391
 imines 277
 impedance technique 361
 inhibition efficiencies (IE) 99, 261, 355
 inhibitor adsorption 5, 7
 inorganic corrosion inhibitors 310
 inorganic substance 67
 integrity operating window 394
 interfacial polymerization 346
 intergranular corrosion 227
in vitro ecosystem 308
 iron reducing bacteria (IRB) 306
 iron sulfides (FeSx) 339
 isobranyl acrylate 348
 isocyanate 146
 isoprene 262
- k***
 key performance indicator (KPI) 398
Khaya senegalensis (KS) 41
 kinetic hydrate inhibitors (KHIs) 163, 167–169
 kinetics of corrosion 363
 activation controlled corrosion 363–364
 diffusion controlled reaction 364
- l***
 Langmuir adsorption isotherm 13, 103, 150, 172, 205
 laser profilometry 25
 lauramidopropyl betaine 389
 L-cysteine 107

- Leptothrix* sp. 307
 lignocellulosic biomass 33
 linear polarization resistance (LPR) 108, 365–366
 linear polydiamines (PDAs) 278
 liquid healing agent 348
 liquid phase inhibitors 165
 long-chain molecules 79
 low dosage hydrate inhibitors (LDHIs) 163
 lowest unoccupied molecular orbital (LUMO) 101, 135
- m**
 macromolecular chains 234
 maltodextrin (MDL) 206
 manganese and iron oxidizing bacteria (MFOB) 306
 manganese-oxidizing bacteria (MnOB) 307
 mechanical corrosion 338
 2-mercaptobenzothiazole (BMBT) (MBT) 347
 metal deterioration 24
 metal oxidising organisms 306
 metal oxidizing bacteria (MOB) 306, 307
 methane hydrate formation 168, 169
 methanol (MeOH) 167
 2-methylbenzothiazole (BT) 311, 347
 microbial-induced corrosion (MIC) 133
 microbiologically influenced or induced corrosion (MIC) 305, 306
 biofilms 307–308
 corrosion inhibitors 310
 green 311
 inorganic 310
 organic 310–311
 microbes
 APB 307
 MOB 306–307
 SRB 306
- oil and gas industry 309
 hydrocarbon product storage tanks 309
 pipeline internal corrosion 309
 water network systems 309
 polymeric corrosion inhibitors 312–314
 microcapsules 345
 micro-/nanocapsules 346
 mild steel (MS) 98, 259
 mixed-type inhibitor 166
 mixed-type metal anticorrosion inhibitor 31
 molar hydrochloride acid solution 86
 molecular dynamics (MD) simulation 134, 154
 molecular orbital energy gap 4
 monoethylene glycol (MEG) 167
 mono fluoro ammonium salt 169
 monomers 390
 Montmorillonite (MMT) layers 344
 mucopolysaccharide 104
- n**
N-(3-aminopropyl)imidazole (APM) 28, 86
 nanocomposites 13
 nanodiamonds (NDs) 278
 National Association of Corrosion Engineers (NACE) 2
 National Fire Protection Association (NFPA) 399
 native starch (NS) 103
 natural polymeric corrosion inhibitors 26
 cellulose and its derivatives 33–35
 chitosan and its derivatives 26–33
 dextrin and its derivatives 38
 mechanism for 41
 natural gums and derivatives 38–41
 pectin and its derivatives 37
 starch and its derivatives 35–37
 natural polymeric materials 262

- natural polymers 24
 polysaccharides 231–234
 synthetic polymers 234–235
- natural polymer xanthan gum (XG) 39
- natural proteins 272–273
 casein 273–274
 hydrolysate from shrimp by-products 274
 SP 273
 zein 274
- N*-*b*-hydroxyethyl oleyl imidazoline 310
- N-deacetylation process 206
- negative fractional orders 239
- N,N*-dimethylaminobenzaldehyde (CSB-3) 10
- non-ionic amphiphilic chitosan nanoparticles 13
- non-sulfated alginate 233
- N*-vanillyl-*O*-2'-hydroxypropyl trimethyl ammonium chloride chitosan (VHTC) 33
- N*-vinyl pyrrolidone copolymer 168
- o**
- offshore facility operators 24
- offshore operators 23
- oil and gas industry
 hydrocarbon product storage tanks 309
 pipeline internal corrosion 309
 water network systems 309
- open-circuit potential (OCP) 173
- O-phenylenediamine (OPD) 108
- organic and inorganic corrosion inhibitor, in acid media 259–261
- organic compounds 166
- organic corrosion inhibitors 261, 310–311
- ortho-phenylene diamine 279
- outward and inward acid corrosion 258–259
- oxidation corrosion 384
- oxidize soluble divalent manganese (Mn^{2+}) 307
- oxygen (O_2) concentration 196
- p**
- Pachylobus edulis* 41
- parameters of adsorption
 energy of adsorption 359–360
 isotherms 357
 El-Awady isotherm model 359
 Flory-Huggins isotherm 358–359
 Frumkin isotherm model 358
 Langmuir isotherm model 357
 Temkin isotherm model 357–358
- PASP/N-(3-aminopropyl)-imidazole (PD-1) 86
- PASP/N-(3-aminopropyl)-imidazole-co-ndodecylamine (PD-2) 86
- PASP-threonine copolymer 84
- pectates polysaccharides 231
- pectic acid 268
- pectin 6, 37, 234
- Phaeophyceae* 169
- phosphate derivative guanidine copolymerization (PGUC) 280
- phosphorylated xanthan gum (PXG) 40
- phosphorylcholine (PC) 286
- physisorption 244
- pickling corrosion inhibitor 84
- π -electrons 166, 213
- piperonal 12
- piperonal-chitosan Schiff base (Pip-Cht) 30
- pitting corrosion 221, 227, 337
- polar functional groups 24
- polarization resistance 353, 365
- poly(ethylene glycol) 246
- poly(*N*-vinyl caprolactam) 172
- poly(vinyl alcohol) 234
- poly(vinyl caprolactam) (PVCap) 168
- poly(vinyl pyrrolidone) (PVP) 168
- (poly) acrylamide (PAM) 138
- polyacrylic acid (PACA) 284

- polyacrylonitrile (PACN) 284
 polyacryloyl chloride 109
 polyamidoaminoepichlorohydrin (PAE)
 polymeric resins 101
 polyamino polyether
 methylenephosphonate 90
 polyaspartic acid (PASP) 9, 81, 206, 281
 poly(dimethylaminoethylmethacrylate)-*b*-
 polyurethane-*b*-poly(dimethyl
 aminoethylmethacrylate)
 (PDMAEMA-PU) 101
 poly(*N*-isopropylacrylamide)-*b*-
 polyurethane-*b*-poly(*N*-
 isopropylacrylamide)
 (PIA-PU-PIA) 152
 poly(*N*-vinylpyrrolidone)-*b*-polyurethane-*b*-
 poly(*N*-vinylpyrrolidone)
 (PNVP-PU) 101
 poly(tert-butylacrylate)-*b*-polyurethane-*b*-
 poly(tert-butylacrylate)
 (PtBA-PU-PtBA) 152
 polycaprolactone (PCL) 146
 polycarbonate (PC) 146
 poly(2-methyl-1-vinylimidazole)
 (polyCMCh-graft-polyMVI)
 copolymer 28
 poly(amino acid) corrosion inhibitors
 composite polymers 89–91
 homopolymers 81–83
 industrial applications 81
 modified poly(amino acid) and
 poly(amino acid) copolymers
 84–87, 89
 polycyclopentene 348
 polydopamine (PDM) 279, 280
 polyepoxysuccinic acid 90
 polyethylene glycol (PEG) 13, 275
 polyethyleneimine (PEI) 277
 polyethyleneimine phosphorous acid
 (PEIPA) 101
 polyethylene oxide (PEO) 108, 169, 275
 polygalactoronic acid 268
 polymer 125
 polymerase chain reaction (PCR) 308
 polymer-based inhibitor 390
 polymer-based surfactant 66
 polymeric compounds 24
 polymeric corrosion inhibitors, reliable
 methods 24–25
 polymeric quaternary ammonium salt
 133
 polymer nanocomposites 150
 polymers 144
 polymers compounds 134
 polymethacrylic acid (PMAA) 276
 poly 2-methoxyaniline (P2MePANI)
 285
 poly-methyl aniline (PMA) 100
 poly(amino acid) polymer 80
 poly(methyl methacrylate-*co*-*N*-vinyl-
 2-pyrrolidone) polymer 205
 polypropylene glycol (PPG) 275
 polypyrrole (PPy) 344
 polyquaternary amine polymers 127
 polyquaternary inhibitors 126
 polysaccharides 127, 173, 231
 non-sulfated polysaccharides
 I-algicates 233–234
 pectates 234
 solubility of 231–232
 sulfated polysaccharides 234
 types of 233–234
 polystyrene (PS) 286
 polysulfide (PS) 146
 polyterpenes 262
 polytetrahydrofuran (PTHF) 275
 polyurethane (PU) 144, 145
 applications 145
 corrosion inhibitor 148
 nanocomposite 150
 plant resourced PUCI 149
 polyurea-based PUCI 153
 sulfonated-based PUCI 153
 tri-block copolymers 152
 waterborne PUCI 153–154
 mechanism of 154–154

- polyurethane (PU) (*contd.*)
 polymer as an inhibitor 147
 structure 147
 synthesis 145–147
 polyvinyl acetate (PVAc) corrosion
 inhibitor 283
 polyvinyl alcohol (PVA/PVOH) 99, 235,
 282
 polyvinyl pyrrolidone (PVP) 100, 106,
 168, 285
 polyvinylsulfonamides 168
 polyzwitterion (PZ) 286
 potassium iodide (KI) 27, 264
 potentiodynamic polarization (PDP) 31,
 99, 152, 173, 353
 protein adhesion 234
 protein-digesting enzymes 274
Pseudomicrobium sp. 307
Pseudomonas 169
p-toluene sulfonic acid (PSA) 279
- q**
- quaternary PEI (QPEI) 277
 quaternary polymer 126
 quaternization of chitosan 212
- r**
- radial distribution function 72
 Raman spectroscopy 168
 rate of corrosion 236
 recovered shrimps waste products
 (RSWP) 274
 ri-*n*-pentylamine oxide (TPAO) 169
 rotating disk steel (RDS) 276
- s**
- safety on designing corrosion inhibitor
 399
 salicylaldehyde moieties 213
Sargassum muticum 271
 S-benzyl-L-cysteine 107
 scanning electrochemical microscopy
 (SECM) 205, 354, 372
- scanning electron microscopy (SEM) 25,
 28, 353, 367
 scanning Kelvin probe (SKP) method
 373
 scanning vibrating electrode technique
 (SVET) 373
 secondary ion mass spectrometry (SIMS)
 374
 self-healing polymers 345
 semi-batch crystallizers 175
 α - π hyperconjugation 213
 siloxane polyol 146
 small-molecule organic inhibitors 79
 smart coatings 343
 conducting polymer coating 344
 PANI 344
 polycarbazole and derivative 345
 polymer composite coating 343–344
 self-healing polymers 345
 mechanism of 346–349
 micro/nano-capsule, synthesis of
 346
 sodium alginate 5, 112
 sodium alginate (ALG) based corrosion
 inhibitor 7
 sodium arsenite (Na_2HAsO_3) 391
 sodium dodecyl sulfate (SDS) 69, 264
 sodium dodecyl sulphate 36
 sodium ferrocyanide 391
 sodium gluconate 90
 sodium persulfate initiator 28
 sodium pyrithione 311
 sour corrosion inhibitor 386
 soy polymer (SP) 273
 spectral analysis methods 5
 standard Gibb's free energy (ΔG°) 107
 steel surface chemical composition
 196
 stray current corrosion 229
 stress corrosion cracking (SCC) 228,
 339
 sulfide stress cracking (SSC) 339
 sulfobetaine (SB) 286

- sulfonated aromatic polyamide (SAP) 112
 sulphonated-based PUCI 153
 sulphur oxidising bacteria (SOB) 306
 sulphur reducing bacteria (SRB) 306
 sunflower head pectin (SFHP) 268
 surface analytical techniques 367
 EDX 368
 SEM 367
 surfactants 36
 sweet corrosion 131, 197
 synergism 28
 synergistic effect 68
 synthesized triazole-modified chitosan 30
 synthetic heterocyclic molecules 2
 synthetic polymeric materials 275
 polyamides derivatives 279–282
 polyamines derivatives 277
 PANI and PDA 278–279
 PDM 279
 PEI 277
 polyglycols 275–276
 polyvinyl derivatives 282–287
 polyzwitterion 286–289
 synthetic seawater (SSW) 112
- t**
 Tafel polarization methods 108
 tannins 262–263
 target metallic substrate 194
 terpenes 262
 terpolymer 99
 tetra(*n*-hexyl) ammonium bromide (THexAB) 169
 tetra-hydroxyl methylphosphonium sulfate (THPS) 311
 thermodynamic “antifreeze” hydrate inhibitors (THIs) 167
 thermodynamic hydrate inhibitors (THIs) 163
- Thiobacillus* sp. 307
 thiocarbohydrazide (TCH) 13, 31
 thiosemicarbazide (TS) 13, 31
 time-of-flight secondary ion mass spectrometry 374, 375
 total dissolved solid (TDS) 193
 transition electron microscopy (TEM) 25
 triethanolamine 276
 Triton X-100 (TX) 69
- u**
 uniform corrosion 385
 urethane (−NHCOO−)/urea (−NHCONH−)-based multifunctional polymer 144
 uronic acid 233
- v**
 vanillin modified chitosan (Van-Cht) 106
 VIMA/VP(N-vinyl-N-methyl acetamide) 168
 vinyl alcohol (VOH) monomer 283
 vinylcaprolactam (VCap) 171, 176
 volumetric procedure 236
- w**
 waterborne polyurethanes (WPUs) 142, 172
 waterborne PUCI 154
 water contact angle (WCA) 369
 water network systems 309
 waterproofing 234
 water-soluble chitin (WSC) 27
 water-soluble polymeric corrosion inhibitors 98
 aluminum 109
 brass 112–113
 carbon steel 104–107
 copper 109–111
 industrial applications of 113–116
 iron 107–108

water-soluble polymeric corrosion inhibitors (*contd.*)
 mild steel 98–101, 103, 104
water soluble polymers 168
weight-loss (WL) 99, 236, 244, 354
 concentration of inhibitor 355
 temperature effect and parameters of activation 355–356
well completion process 259

X

xanthan gum (XG) 69, 103
X-ray diffraction (XRD) 371
X-ray photoelectron spectroscopy (XPS)
 25, 28, 314, 354, 369–371

Z

Zinc surface 5

