

Subject index

a

- abbreviations 172
- abrasion 258, 301, 331, 379
- abrasion behavior 261
- abrasive agent 261
- acid pumps 244, 380
- acid recovery process 358
- acid tanks 354
- acid thickener 303
- activation 236
- active range 124–125, 139, 273
- active-passive transition 50–51, 53, 55, 67, 92, 125
- activity coefficient 5
- additives 172
- aeronautical engineering 342
- ageing 383
- ageing tank 258, 273, 331
- alkali batteries 23
- alkali silica reaction 151
- alkali-electrolysis plants 62
- alkaline degreasing solution 25
- allylamine 30
- alternating 15
- aluminates 13, 25
- aluminate solution 41, 50
- aluminium oxide layer 25
- aluminous clays 46
- amalgam process 7
- amorphous alloys 350
- amphoteric metal 13, 25
- annealing (austenitising) 263
- annealing (stabilising) 263
- anode 108, 146
- anode material 140
- anodic dissolution 31
- anodic oxidation 36
- anodic passivation 40
- anodic polarisation 17, 106
- anodic protection 13, 22, 50–51, 55, 57, 273, 331
- anodising tank 333
- apparatus enamel 157
- apparatus engineering 186
- aqua regia 237, 239, 243, 305, 338, 340, 342–343, 347, 356–357, 370, 380, 397, 403, 407
- ASTM 28A 314
- ASTM 28B 314
- ASTM G3 21
- ASTM G5 21
- ASTM G-28 300, 320
- ASTM G-28 A 290, 328
- ASTM G-28 B 315, 336
- ASTM G-28 (test) 300
- ASTM G31 21, 82
- ASTM G38 21
- ASTM G39 21
- ASTM G44 21
- ASTM G46 21
- ASTM G49 21
- ASTM G71 21
- ASTM-Teflon thread test 323
- atmospheric influences 174
- atomic absorption spectrometry 268
- autoclave 136
- automobile exhaust catalyst 237

b

- ball indentation hardness 388
- bauxite 11, 51
- Bayer digestion plant 46
- Bayer process 11, 46, 49–50
- Bayer solution 48–50
- Bayer solution (artificial) 47
- Bayer solution (industrial) 51
- benzylamine 30
- beverage 363

- binders 357, 415–416
- bisphenol resin 401
- blast furnace 80
- blast heater 80
- bleaching plant 296
- bleaching solution 145, 296
- blistering 387
- boiling point 5
- bolts 244, 333
- breakthrough potential 299, 316
- brightener baths 289
- brightening bath 242
- brown coal 298
- brown coal-fired power station 316
- burner nozzle 80
- bursting 248
- butylamine 30

- c**
- carbide precipitation 112, 133
- carbon dioxide 4, 6
- carbon plates 354
- carbon solubility 133
- carbon steel pipes 93
- cathode 108
- cathodic corrosion 19
- cathodic corrosion protection 13, 21
- cathodic polarisation 17, 55, 90, 106
- cathodic protection 19, 22, 93
- caustic soda 4
- cavitation corrosion 35
- cellulose digestion 54
- cement mortar 151
- cementite 44
- centrifugal pump 333
- centrifuges 265
- ceramic bricks 381
- ceramic plates 381
- CERT experiment 45
- CERT test 18, 53, 56, 60, 64, 73, 81–82, 101, 112
- CF 19
- chemical **178**
- chemical apparatus 289
- chemical brightening 242, 289
- chemical degradation **174, 176**
- chemical etching 38
- chemical glasses 358
- chemical milling 26
- chemical plant engineering 154
- chimney linings 362
- chinalizarin 38

- chloralkali electrolysis 6, 7, 9, 146, 187, 189, 192
- chloralkali electrolysis cell 150, 153
- chloride adsorption 257
- chlorides 236
- chlorine 296
- chlorine detonating gas 7
- chlorine dioxide 296
- chlorine dioxide stage 297
- chlorine gas scrubbers 145
- chlorine-alkali electrolysis plant 322
- chlorine-alkaline electrolysis 322
- chromium baths 337
- chromium carbide precipitate 115–116
- chromium coatings 33
- chromium depletion 112
- chromium diffusion layers 33
- chromium powder 33
- circulation pump 331
- cladded layer 319
- cladding 93, 188, 319, 410
- cleaning cells 108
- cleaning (chemical) 345
- cleaning mordant 345
- cleaning solutions 25, 286
- cleaning vats 337
- coating 109, 186, 188, 208, 405
- coating systems 184
- coil annealing line 253
- combustion of natural gas 256
- compact tension specimens 126
- compressors 166
- concentration stage 289
- condensate 256
- construction materials 289
- continuous temperature 383
- control of inert gas 322
- coolers 239
- cooling coils 250
- cooling devices 398
- cooling jacket 250
- cooling pipes 333
- cooling spiral 322, 337
- cooling system 250
- cooling water 245
- copper pipes 35
- corrosion 26, 290
- corrosion element 20
- corrosion fatigue 19, **61**, 67, 78
- corrosion fatigue tests 78
- corrosion (intergranular) 320, 335
- corrosion protection 21
- corrosion testing 20

cover diaphragm cells 187
 crevice corrosion 320
 crevice corrosion temperature 316
 critical potential range 43
 critical stress intensity factor 51
 crystallinity 171
 CT specimens 126
 current density-voltage curve 245
 CVD process 196–197
 cyclic bending tests 78
 cypress 404

d

damper registers 398
 decomposer 46
 degradation (chemical) 387
 degradation (hydrolytic) 388
 degradation (oxidative) 388
 degradation (thermal) 387
 degradation (thermal oxidative) 387
 degreasing solutions 25
 descale 236
 descaling 342, 345
 descaling mordants 345
 detinning 142
 dew point 256
 dew point region 242, 256
 dezinc 246
 dezincing 247
 diaphragm process 7
 diaphragms 150
 differentiation tests 261
 diffusion 387
 digester agitator 289
 DIN 50905 21
 DIN 50905-2 21
 DIN 50905-3 21
 DIN 50915 58, 60
 DIN 50920-1 21
 disodium phosphate 25
 dissolved lime 9
 distillation columns 251
 dithiooxamine 38
 downdraft evaporator 108
 drainage gutters 362
 drum 302
 drying agent 6
 drying tower 322
 dye penetration test 363

e

elastomers 384
 elbow 43

electrochemical etching 38
 electrode materials 23
 electrolysis cell 146
 electrolytic decomposition 7
 electronics industry 350
 electroplating 237, 304, 337, 346, 358–359
 embrittlement 345, 388
 enamel coatings 154, 359
 enamel corrosion 360
 enamel frit 154
 eosine 38
 epoxide resin coating 151
 etching 107, 236, 241
 etching agent 141, 358
 etching attack 107
 ethylamine 30
 evaporating stage 35
 evaporator 34–35, 63, 143, 189, 289, 354
 evaporator boiler 109
 evaporator pipes 333
 evaporator plants 108
 evaporator stage 356
 evolution of hydrogen 344
 explosive cladding 109, 319, 410
 extraction plants 274
 extraction tanks 275

f

faraday law 350
 fatigue cracks 77
 feed water 77
 ferrite 44
 ferrite grains 44
 FGD 319
 FGD media 316
 FGDP 298, 316, 406
 FGD scrubber 318–319
 fillers 384
 filling ports 333
 filter 296
 filter frame 289
 filtration stage 289
 flexural strength 388
 floor coverings 362
 flue gas cleaning 316
 flue gas cleaning plants 237
 flue gas desulfurisation engineering 410
 flue gas desulfurisation plant 298, 316, 319
 fluorinated polymers 409
 fly ash 242, 256
 food industry 88, 286
 foodstuffs 363

free corrosion 125
 free corrosion potential 20, 74
 friction bearing material 246
 fuel gas desulfurisation plants 406
 furfuryl aldehyde 38

g

galvanic anodes 22
 galvanic corrosion 20
 galvanic engineering 304
 glass fibres 153, 410
 glucose 38
 gold seals 159
 grain boundary 118–119, 159
 graphite anode 146
 graphite electrodes 146
 green death 314–315, 319, 321
 gypsum deposits 316

h

H-SCC 15
 hammer works 333
 hard coal 298
 hard rubber 403
 hard-chrome plating 398
 hard coal-fired power stations 316
 heat exchangers 37, 77, 143, 151, 182,
 242, 256, 289
 heat transfer system 322
 heat treatment 117–118, 133–134
 heat-treated steels 66
 heater 333
 heating elements 354
 heating pipes 242, 289
 heavy metal ions 236, 334
 high-performance ceramic 168
 high-performance material 159
 high-temperature water 128
 hole spot welding 318
 hollow sample 95
 hot rolling 410
 hot-roll cladding 319
 HPS 405
 HVOF 405
 hydrogen embrittlement 339–340,
 343–344, 347, 350–351
 hydrogen peroxide 296
 hydrogen reference electrode 20
 hydrogen uptake 344–345
 hydrogen-assisted stress corrosion
 cracking 15, 53
 hypochlorite 296

i

immersed bath heaters 304, 346
 immersion bath heater 237
 impact strength 388
 impedance measurement 406
 impregnation agent 354, 415
 impressed current process 22
 industrial air 242, 256
 industrial waste gas 358
 inert gas welding 333
 inhibition 29
 inhibitors 25, 29, 36–37, 74, 242, 244, 251,
 289
 interface corrosion 271
 intergranular corrosion 119, 128, 290
 intergranular stress corrosion cracking 16
 ionising radiation 174
 iron impurities 41
 iron migration 318, 410
 ISO 11782-1 21
 ISO 11782-2 21

j

jet engine 31, 166

l

laboratory equipment 382
 lead chamber process 337
 light-stabilisers 172
 lime-soda process 9
 limestone suspension 316
 linear polarisation 62
 linings 209, 333, 405
 local corrosion 237, 316
 low-pressure turbine 65
 LPPS 405
 LPVCD 196

m

main fields of utilisation 10
 manual arc welding 321, 333
 manufacture 6
 masonry linings 362
 MAW 321, 333
 medical implants 146
 membrane electrolysis 7
 membrane process 146
 mercury process 7
 metallic coatings 21, 189, 208
 metallurgy 237
 metal recovery 237
 metal sheeting 318
 metal waste 305

metal-non-metal composites 195, 209
 metal-steel composites 195, 209
 methylamine 30
 microorganisms 174
 microstructural state 320
 milling (chemical) 236, 342
 mirror finish 265
 mixed acid vapors 252
 mixing vat 250
 molecular structure 171
 mordants 251, 253, 262–263, 277, 344,
 354, 407, 413
 moulded ceramic bricks 354

n

NaOH melt 63, 71, 74, **93**, 110–111, 137,
 139, 141–142, 148, 151, 162, 164, 205
 natrium causticum 4
 natrium hydricum 4
 natural gas 242
 natural gas condensate 242, 256
 Nernst equation 12
 nickel-chromium-iron alloys 110
 nickel coating 109, 189, 192
 nickel-copper-phosphorus coatings 189
 nickel-phosphorus coatings 189
 nickel pipes 35
 nickel-plating baths 354
 nickel tanks 109
 nitrating acid 243, 265, 290, 403
 nitrating acid tank 247
 nitrating centrifuge 251
 nitrating vessels 265
 nitrating works 404
 nitration 236, 265–266
 nitric and sulfuric acids 257
 nitrobenzoic acid 25
 nitrocellulose 251
 non-amphoteric metals 13
 notched bar impact strength 388
 nozzles 166
 nuclear material 339
 nuclear reactors 347
 nuclear waste 339
 nuts 333

o

oil supply line 31
 organic coating 21, **188**, 208
 oxalic acid 290
 oxidation (anodic) 241
 oxide layer 245
 oxidising agent 37

oxygen corrosion 244

p

packaging material 398
 packing materials 404
 PACVD 196
 paper and pulp industry 145, 315
 paper industry 237, 246
 paper manufacturer 296
 paper plant 298
 passivation 74, 275, 288
 passivation behavior 40
 passive current densities 245
 passive layer 142, 144
 passive range 45, 51, 92, 115, 125, 137,
 275, 296
 Pauling tower 251
 permeation **175**, 387
 pharmaceuticals 363
 phenol epoxide resins 196
 phloroglucine 38
 phosphate ores 258, 331
 phosphoric acid 331, 333
 phosphoric acid plant 256, 258, 301–302,
 356
 phosphoric acid processing plant 289
 phosphoric acid production 333, 354, 403,
 413
 phosphorus contents 44
 phosphorus segregation 45, 68
 photooxidation 174
 pickle **26**, 236, 347
 pickling 251
 pickling baskets 333
 pickling baths 26, 354
 pickling pores 264
 pickling process 262
 pickling rack 327
 pickling tank 395
 Pickling tests 277
 pickling time 26
 pickling vats 362
 picric acid 266
 pigments 384
 pipe 111, 120, 398
 pipeline 43, 105, 181, 186–187, 265, 289
 pipeline construction 402
 pistons 166
 pitchpine 404
 pitting corrosion 13–14, 32, 107, 148, 242,
 245, 262, 289–290
 pitting corrosion potential 290, 316
 plasma-plug welding 321

- plastic composites 383
 - plastic waste 316
 - plasticizers 384
 - plastics 172, 177
 - plate heat exchanger 327
 - plates 381
 - plumbates 13
 - plutonium 268
 - polarisation curves 244
 - polishing (chemical) 236
 - polishing (electrochemical) 236
 - polishing (electrolytic) 273
 - polyamide-epoxide resin coatings 184
 - polyester-epoxide resin coatings 184
 - potential–acidity diagram 71
 - potential–pH diagram 12, 23, 71
 - potentiostatically impressed current 45
 - Pourbaix diagram 71
 - power generator 77
 - power station 65, 67, 77, 298
 - power station engineering 316
 - practical galvanic series 20
 - pre-oxidation 380
 - pre-scrubber 299
 - pressure vessel 47
 - pressure vessel steel 47
 - pressurised-water reactor 119, 122, 126
 - printing plates 241
 - process tanks 289
 - processing 333
 - production of raw phosphoric acid 302
 - propyl nitrate 266
 - propylamine 30
 - protection 273, 331
 - PTFE claddings 182
 - pulp and paper 296
 - pulp and paper industries 42, 88, 145
 - pulp industry 55, 362
 - pulp manufacturer 296
 - pulp plant 298
 - pump 182, 265, 289, 333, 398, 409
 - pump material 186, 198, 335
 - purex process 339, 347, 350
 - putties 415
- q**
- quartz material 416
 - quencher 299
- r**
- railway tank wagons 109
 - raw gas inlet duct 318
 - raw gas inlet zone 322
 - raw nitro-glycerine 265
 - raw phosphoric acid 302
 - reaction stage 289
 - reaction tanks 289
 - reaction vessels 407
 - reactor 70, 94, 143
 - reactor engineering 143
 - reactor fuel element 268
 - reactor turbine agitators 289
 - reactor vessels 354
 - reduction factors 387
 - refractory metals 351
 - region of the weld seam 252
 - reinforced plastics 198
 - repassivation ability 318
 - repassivation potential 299, 316
 - resistance factors 178
 - resistance to chemicals 174
 - resorcin 38
 - rest potential 20
 - reverse flexural fatigue strength 377
 - roof construction 404
 - rotary-shaft seals 182
 - rotor blades 79
 - rotor steel 70
- s**
- SCC 15
 - SCC damage 16
 - SCC resistance 87, 111, 128, 132–133
 - SCC susceptibility 18
 - scrubbers 265, 296, 298, 318
 - scrubber column 333
 - scrubber filtrate 298
 - scrubber solution 299
 - scrubbing acids 244
 - scrubbing process 316
 - sealing material 151, 398
 - sealing seam 319
 - seals 184, 194, 208, 409
 - seawater 245
 - secondary water 122
 - secondary water cycle 119
 - semi-finished product 320
 - separators 265
 - shallow pit corrosion 14
 - silver autoclave 23
 - simulated FGD solution 316, 322
 - sintering 373, 382
 - slurry pumps 289
 - S-N curve 79
 - sodium carbonate 25
 - sodium hydrogen carbonate 25

- sodium hydroxide melt 23, 31, 35
 sodium silicate 25
 soot 242, 256
 spent mordants 395, 398
 spinning baths 354
 spray-etching 107
 spraying processes 405
 spring alloys 40
 springs 409
 stabilisers 172
 stainless steel mordant 409
 static tensile stress 15
 steam boiler 90, 93
 steam generating plants 128
 steam generation 77
 steam generator 77, 119, 122, 126,
 128–129, 131
 steam generator pipes 122–123
 steam turbine 67, 79, 203
 steam turbine rotor 66
 steam turbine rotor blade 118
 steam-boiler pipes 88
 steel construction 405
 steel pipe 263
 steel valves 109
 steel vessel 46
 stirred vat 250
 stirrer 250, 302, 337
 stirrer blades 333
 stirring arm 303
 stirring vessel 183
 storage 42, 90, 105, 109, 180, 184–185,
 187, 247
 storage tanks 289, 413
 stress corrosion cracking 13, 15, 22, 36,
 39, 41, 42, 43–44, 46, 50–51, 57, 63, 65, 67,
 77, 79, 81, 88, 90, 101, 109, 111–112, 122–
 123, 126, 133, 151, 166, 245–247, 306,
 316, 335
 stress corrosion cracking
 (intergranular) 43–45, 53, 112, 122, 128
 stress crack formation 174
 stress cracking 387
 stress cracks 174, 177, 387
 stress intensity factor 57
 stuffing boxes 244
 sugar manufacturing 246
 sulfate-pulp factory 150
 sulfuric and hydrofluoric acids 257
 sulphur 117
 superaustenite 299, 303
 superconductors 362, 370, 417
 surface cleaning 343
 surface glaze 382
 surface treatment 342
 swelling 174, 174–175, 387, 396, 403
- t**
- Tafel method 62
 tank 105, 180, 187, 362
 tankers 289
 tantalum caps 159
 tantalum screws 159
 tensile stress 15
 thermoelastics 384
 thickener 333
 thickening tanks 363
 thiourea 38
 TIG 321, 333
 tilting pans 289
 tin coatings 142
 titanium anodes 146
 torsional oscillation test 383
 trade names 173, 194, 277, 306
 transition joints 96
 transpassivation 296
 transport 42, 53, 105, 109, 180, 186–187
 tubular heating coils 289
 tungsten inert gas welding 321
 turbine blader 67, 77
 turbine blades 203
 turborotors 377
 type of inert gas 322
- u**
- U-bend flexural specimens 339
 uniform surface corrosion 13
- v**
- vacuum evaporator 35
 valve 62, 109, 182, 189, 265
 valve casings 181
 valve material 335
 valve seatings 181
 vapor phase 239
 vat 250, 265
 ventilators 252
 vessel 63, 88, 105, 187
 vessel material 268
 vinyl ester-based coating 187
 viscoelasticity 387
- w**
- wallpapering 318
 waste acid 251
 waste gases 93

waste incineration plant 298, 316, 319
waste (nuclear) 327
waste treatment 363
water-line corrosion 270
water/steam cycle 122
weld resurfacing 410
weld root 322
welding filler 322
welding process 322
welding speed 322
weldment 247
wet combustion 339

wet process 331
wet scrubbing process 237, 298, 406
wet washing process 356
wet-dry zone 322
WIP 298, 316, 319
Wöhler diagram 19
Wöhler stress-cycle curve 78
wooden stirrers 404
wooden vats 404

z
zincates 13