

Index

a

absorption 9, 262, 353, 414, 416
 acid corrosion 31, 63, 74, 161, 165,
 166, 268, 283–285, 295, 426
 acid gases 7, 13, 16, 19–21, 29, 37,
 101, 111, 121, 232, 247, 262, 289,
 303, 304, 311, 425
 acidizing 63, 74, 153, 154, 308
 acid-producing bacteria 12, 324
 acrolein 426
 adhesion 219, 400
 adsorption 28, 29, 33, 86, 89, 90, 98,
 100, 146, 157, 162, 164, 168,
 182–184, 195–197, 210, 211, 218,
 219, 234, 274, 279, 286, 292, 304,
 305, 308, 313, 315, 333, 342, 360,
 363–373, 385, 393, 395, 396,
 398–400, 413, 414, 424
 aerobic 21, 64, 97, 241, 323, 325, 332
 aldehydes 164, 281, 363, 364, 426
 amine 12, 14, 15, 18, 23, 32, 33,
 99–101, 123, 161, 162, 219, 234,
 235, 237, 238, 247, 262–265, 267,
 268, 295, 296, 347, 364, 398, 399,
 422, 425, 427
 antiscalant 385, 388–400, 423
 Arrhenius equation 78
 asphaltene dispersant 423, 426
 ASTM 68, 128, 343, 349
 autoclaves 78, 125

b

bacteria 12, 21, 26–28, 35, 36, 63–66,
 86, 97, 102, 111, 218, 219,

321–323, 325, 328, 329, 331, 332,
 334, 385, 421, 427

bicarbonate 53, 66, 67, 89, 279
 bioaccumulation 238, 351
 biocides 25, 26, 36, 65, 73, 97, 98, 116,
 219, 240, 322, 325–327, 329–331,
 333, 334, 399, 427
 biocorrosion 102, 219, 324
 biodegradation 241, 351
 biofilms 36, 64, 97, 218, 220, 322, 323,
 325, 332, 333
 biofouling 23, 36
 bio surfactant 333
 bubble test 120, 122

c

capital expenditures (CAPEX)/
 operational expenditure (OPEX)
 balance 111, 114, 117, 129,
 143, 181, 411
 carbon dioxide (CO₂) 7, 10, 67, 68, 88,
 101, 135, 177, 267, 289, 292, 293,
 297, 313, 387, 414, 422
 carburization 273, 275–277
 catalytic cracking 30, 259, 260,
 262–264, 268
 chemical cleaning 304, 315
 chitosan 98, 210, 304, 374
 chlorination 272, 273, 277
 CI Integrity Operating Window
 (CI-IOW) 117, 119
 coatings 12, 19, 22–24, 26, 33, 36, 38,
 54, 72, 145, 146, 218, 240, 303,
 326, 351, 359, 374, 375, 427

- CO₂ corrosion 19, 20, 24, 67, 70, 71, 79, 89, 101, 113, 114, 117, 136, 178, 180, 182, 184, 185, 198, 212, 215, 218–220, 231, 293, 297, 367, 399
- corrosion 3, 4, 7–38, 41, 42, 45–48, 50–74, 77–91, 95–98, 100–102, 111–114, 116, 117, 119–123, 125, 127–129, 135–147, 156, 161–168, 170, 171, 177–185, 194–198, 210–212, 214, 215, 218–220, 229–235, 237–239, 241, 244, 245, 247, 257, 258, 262–265, 267, 268, 271–281, 283, 285, 286, 289–297, 303–306, 308, 311, 313–315, 317, 321, 323, 325–329, 331–334, 339–343, 345–349, 351, 353, 359–376, 385, 387, 389, 397–400, 414–416, 422–427
- corrosion cell 45–47, 127, 312, 369
- corrosion cost 4, 136–140, 143, 147, 230
- corrosion cycle 29
- corrosion inhibition 4, 12, 15, 19, 23, 24, 32, 73, 78, 79, 82, 86, 91, 98–101, 122, 136, 145, 151, 161, 165, 168–170, 182, 184, 196, 197, 210, 211, 214, 218, 219, 234, 237, 238, 244, 247, 257, 273, 284, 286, 290, 293, 296, 304, 305, 329, 331–333, 360, 365, 370, 374, 399, 414, 415, 424, 426
- corrosion inhibitor 4, 10, 12–15, 19–22, 24, 28–30, 33, 36–38, 53, 63, 73, 74, 79, 81, 98, 100, 102, 114, 116, 117, 119, 121–123, 127, 145, 146, 160–162, 164–167, 182, 183, 214, 233, 234, 241, 244, 245, 266, 268, 278, 279, 283, 290–292, 294–297, 304, 313, 315, 332, 333, 346, 348, 349, 351, 360, 361, 363–369, 374, 376, 385, 397–399, 414–416, 423, 426
- corrosion loop test 121, 127, 128
- corrosion management 4, 22, 31, 111, 129, 135, 136, 138–140, 142–144, 147, 182, 286
- corrosion mechanisms 21, 28, 29, 38, 51, 86, 111, 117
- corrosion resistant alloys 73, 111, 114, 182
- crevice corrosion 35, 54, 55, 136, 303
- crude oils 3, 6, 7, 18, 23–25, 30, 32, 68–73, 135, 145, 183, 219, 255, 257, 262, 263, 265, 267, 268, 283, 284, 342, 343, 345, 348, 421–425
- d**
- deep water subsea systems 295
- degradation 17, 32, 33, 41, 90, 135, 141, 179, 267, 274, 286, 425, 427
- design 16, 17, 21, 26, 29, 33, 56, 59, 72, 73, 112, 113, 116, 117, 119, 136, 139, 182, 303, 414, 415
- Domino theory model 142
- downstream 3, 15, 30, 33, 37, 86, 141, 219, 266, 267, 295, 396, 411
- e**
- begin
- electromotive force (EMF) series 49, 50
- emulsion 7, 12, 14, 20, 21, 33, 37, 68, 117, 120, 124, 146, 157, 266, 268, 289, 295, 345, 409
- emulsion tendency test 120
- enhanced oil recovery 38, 89, 240, 289, 397
- environmental factors 23, 78, 84, 101
- erosion corrosion 58, 60, 82, 112, 136
- f**
- filming inhibitors 17, 18, 264, 265, 267, 268
- flow rates 20, 27, 36, 59, 66, 78, 82, 98, 101, 142, 146, 157, 194, 195, 305, 412
- flow type 78
- foaming 14, 33, 63, 120, 125, 126, 244, 268, 369

fouling 32, 35, 36, 86, 264, 266,
304, 323, 341, 349, 422,
424–427

g

galvanic corrosion 11, 17, 19, 35, 50,
52–54, 112, 136
gas hydrates 407, 410, 413, 416
glass reinforced plastic 116
gross domestic product 136, 229

h

halite 387, 392
H₂S corrosion 9, 19, 24, 74, 86–88,
136, 141, 230, 232, 263
hydrate inhibitors 296, 409, 410,
414–416
hydrochloric acid 8, 63, 79, 154, 257,
277, 304, 374, 422
hydrofluoric acid 11, 63, 154, 308
hydrophilic 238, 240, 241, 365
hydrophobic 183, 184, 210, 218, 238,
241, 265, 364, 365, 368, 373, 395,
412, 414
hydroprocessing units 260, 266

i

interferences 36, 82
intergranular corrosion 57
ionic liquids 247
iron oxide 87, 89, 184, 332, 343,
385
iron-oxidising bacteria 323, 324
iron sulfide 9–11, 16, 19, 24, 38, 62,
86, 87, 100, 263, 290, 292, 304,
312, 385, 400, 421, 422

j

jet impingement 121, 128, 129

k

kinetic hydrate inhibitors 296,
412–414

l

low-dosage hydrate inhibitors 412

m

mackinawite 87, 232, 292, 388, 400
mechanical properties 77, 112, 129,
346
mercaptans 257, 262, 281, 284, 347,
421
microbial corrosion 329
microbiologically influenced corrosion
51, 63–66
microorganisms 29, 36, 96, 97, 99,
102, 177, 321, 323, 325, 327, 329,
332–334
midstream 3–5, 25
modeling 89

n

NACE-IMPACT 4, 138
nanocomposites 98, 308, 312, 317
naphthenic acids 31, 70, 141, 257, 259,
260, 263–265, 267, 268, 271, 283,
284, 287
natural gas 3, 6, 7, 25, 27, 135, 177,
230, 289, 291, 295, 325, 342, 407,
410, 421
neutralisers 426
nitridation 273, 277
nucleation 87, 181, 386, 393–395, 409,
412, 415, 416

o

oil and gas 3, 4, 7, 8, 12–14, 23, 25, 28,
41, 42, 51, 52, 55, 61, 63, 64, 66,
69, 70, 72–74, 77, 86, 88, 97, 102,
111–113, 115–117, 122, 129,
135–137, 140–144, 146, 147, 153,
177, 178, 181–183, 229, 230, 247,
271, 272, 277–279, 282, 283, 285,
286, 289, 296, 297, 303, 304, 321,
323–326, 329, 333, 334, 339, 340,
342, 344, 346, 359, 360, 363, 364,
367, 369, 374, 375, 385, 411, 416,
421, 422, 424, 427
oil wells 5, 6, 12, 13, 25, 66, 77, 86,
90, 155, 156, 218, 229, 230, 311,
315
organosulfur compounds 421

oxidation 9, 34, 44, 46, 50, 73, 83, 179,
181, 184, 218, 220, 255, 272–278,
341, 370, 372, 376

oxidisers 426

oxygen corrosion 16, 17, 19, 136

p

partial pressures 8, 9, 13, 37, 101, 113,
127, 178–180, 230, 233, 276, 277,
294, 311

partitioning 82, 117, 120, 122, 123

pipelines 3, 14, 23, 25–30, 41, 47, 51,
53, 56, 65, 69, 71–74, 78, 82–84,
86, 95, 97, 98, 100–102, 112–114,
117, 128, 129, 135, 139, 141–143,
146, 177, 178, 180–182, 197, 211,
219, 220, 229, 230, 271, 289, 292,
295–297, 303, 322, 324–326, 342,
343, 346, 359, 364, 367, 368, 410,
414, 416

pitting 11, 17–22, 27, 28, 31, 32, 35,
36, 38, 41, 51, 55, 56, 86, 88, 91,
95, 102, 111, 121, 125, 127, 142,
178, 233, 262, 263, 267, 290, 292,
296, 297, 311, 333, 422

plant biomass extracts 210, 211, 215

polymers 97, 116, 120, 157, 182, 210,
212, 219, 244, 247, 304–308, 313,
315, 316, 326, 366, 389, 412–416,
425

potentiodynamic polarization 85, 90,
91, 161, 164, 211, 218, 273, 283,
349

potentiostatic polarization 91

pre-corrosion 78, 100, 102, 127, 128

probes 20, 26, 28, 121, 123, 127, 129,
266, 267

produced fluids 3, 13, 24, 41, 111, 113,
120, 311, 397, 398

produced water 4, 16, 20, 21, 28, 47,
79, 81, 90, 114, 117, 120, 121,
194, 218, 219, 230, 315, 387, 388,
396, 410, 422, 425, 426

q

quaternization 317

r

refineries 3, 25, 30–33, 70, 77, 135,
140, 143, 219, 230, 255–258,
262–265, 267, 268, 271, 324,
341–343, 345, 411, 421

s

scale 10, 11, 14, 18–23, 28, 29, 35–37,
51, 63, 68, 78, 79, 89, 101, 102,
141, 146, 155, 159, 178–182, 194,
196, 197, 220, 229, 232, 267, 273,
274, 277–279, 289, 290, 303, 304,
311, 312, 315, 341, 346, 351,
367, 369, 371, 385–389,
391–396, 398–400, 410, 421, 422,
425–427

scale inhibitors 16, 18

scale mechanism 385

scaling process 385, 386, 389, 393,
400

sour corrosion 24, 37, 38, 86, 102, 230,
232–234, 237, 238, 241, 243, 244,
247, 292, 312, 313, 400, 425

stainless steel 15, 19, 21, 23–25, 31,
35, 57, 58, 60, 72, 113, 116,
168, 218, 264, 322, 329, 333, 346,
398

stress corrosion 14, 17, 51, 85, 86, 141,
262, 267, 311

sulfate reducing bacteria 64, 86

sulfide scavengers 422, 423, 425, 426

surfactants 33, 69, 79, 86, 90, 97, 146,
162, 182, 210, 219, 237, 238, 241,
243, 244, 303, 333, 376

sweet corrosion 12, 24, 70, 88, 89,
102, 177–180, 182, 184, 211,
219

sweetening 255, 257, 272, 276, 422,
423

synergism 91, 184, 220, 305

t

thermal cracking 257, 259, 260, 421
thiophenes 257, 421
titrability 122
toxicity 237, 241, 244, 303, 315, 333,
351, 411, 421, 426
triazole 163, 165, 171, 282, 283, 347

u

under-deposit corrosion 16, 20, 22,
37, 62, 290, 385, 426

uniform corrosion 51, 55, 56, 66, 68,
95, 233, 311
upstream 3–5, 7, 14, 37, 41, 70, 73, 74,
86, 219

v

vapour phase corrosion inhibitors 341

w

wheel tests 120, 125, 126

