

Index

a

- α -acetamidoamides 303
- α -acetoxyketones 277
- α -acetoxylation 4, 5, 357
- α -acetoxylation of carbonyl compounds 4–5
- α -acryloyloxy ketones 286
- α -acyloxy carbonyl compounds 286
- α -acyloxy ethers 86–88
- α -acyloxy ketones 84–86
- α -alkylated BODIPYs 96–97
- α -amino acids 101, 193
- α -azidocarbonyls 290
- α,β -amino acids 132
- α,β -diphenylthio enones 139
- abietic acid 394
- α -bromostyrenes 261
- α,β -saturated ketones 303
- α,β -unsaturated carbonyl compounds 44, 303
- α,β -unsaturated carbonyls 28
- α,β -unsaturated carboxylic acids 30
- α,β -unsaturated esters 258
- α -carboalkoxy ketones 251
- α -C-bonded iodane intermediate 278
- acetate esters 387
- acetic acid 4, 11, 277, 387
- acetic anhydride 246, 300, 336, 341, 347, 387
- acetyl hypoiodite (IOAc) 122
- achiral aryl(hydroxy)iodonium salts 192
- achiral iodoarene 186
- achiral pseudocyclic amide-stabilized λ^3 -iodanes 191
- achiral XB donor 44
- acid-exchanged I(III) products 338
- acid hydrazides 107
- acridone derivatives 161
- acrylic acid (AA)-based SAP 405
- activated α -substituted β -oxonitrile compounds 304
- active esters 72
- active iodine(I) catalyst 130
- active oxygen content 335–337, 340, 363
- acyclic alkenes 311, 363
- acyclic diaryliodonium salts 164
- acyclic ureas 153
- 2-acylamino-*N*-phenyl benzamides 157
- 2-acyl chromans 288
- 2-acyl-2,3-dihydrobenzofurans 92, 287
- acyl hypoiodite 131
- 3-acyloxy-2,3-dihydrobenzofurans 88, 89
- acyloxy radical 102
- acyl peroxides 73, 74, 85
- 2-acyl tetrahydrofurans 289
- adamantyl ester-bearing catalyst 246
- adamantyl/menthyl ester 281
- aerobically generated acetoxy radicals 339
- aerobically generated (2-*tert*-butylsulfonyl)iodylbenzene 356
- aerobically generated I(III) reagents 355
- aerobically generated pseudocyclic iodylarenes 316
- aerobic iodoarene catalysis 21
- α -fluorination reactions 357
- α -functionalization of carbonyl compounds 140

- AIBX 313
- α -iodo adduct 79
- α -keto acids 94, 96
- α -ketoamides 70, 71
- alcohol and amine oxidation 337
- aldehydes 27, 72, 99, 286
- aldimine 290
- aliphatic amines 108, 109
- aliphatic carboxylic acids 85, 86
- aliphatic cycloamines 166
- alkali metal iodides 287
- alkenecarboxylic acids 368
- alkene difunctionalization 140, 243
- alkenes 88, 96
- (*Z*)-alkenes 263
- 2-alkenylindoles 50
- 3-alkoxy-2-iodylpyridines 313
- (4-alkoxyphenyl)phenyliodonium salts 398
- alkyl alcohols 91
- alkylamines 132
- alkylarenes 82
- alkylated aryl tetrazoles 77
- 9-alkylated purine derivatives 75, 76
- 2-alkylated tetrazoles 77, 78
- alkylbiaryls 163
- alkyl diacyl peroxides 76
- alkyl ethers 74, 75
- alkylhydroperoxides 12, 15, 276, 287, 289
- alkyl iodides(I) 128, 129
- alkyliodine(I) catalysis 140
- alkyliodine(III) 130
- alkyliodine(III) intermediate 129
- alkyliodines 110, 121
- alkyl 3-oxopentanedioate monoamide derivatives 285
- alkyloxyamines 83
- alkyl peresters 76
- alkylstyrenes 266
- alkyl substituents 342
- alkyne-azide click reaction 51
- alkynyliodonium salts 3
- all-carbon dimethanoanthracen 202
- allyl alcohol 82, 83, 280
- allyl ethers 258
- allylic alkenes 96, 97
- allylic and benzylic $\text{Csp}^3\text{-H}$ 77
- allylic carbamate 249
- allylic cation intermediate 77
- allylic esters 89
- allylic ethers 252
- allylic sulfones 96, 98
- allyl silanes 30
- allyltrimethylsilane 39
- aluminum complex/*n*-Bu₄NI 93
- American Chemical Society presents the National Award for Creative Research and Applications of Iodine Chemistry 3
- α -methyl styrene derivatives 98
- amide compounds 72
- amide dimer 91
- amides 69, 81, 310
- amide-substituted Ishihara-type catalyst 245
- amidyl radicals 81, 139
- aminals of α -amino esters 132
- amination reactions 129, 362
- amine-catalyzed oxidation reaction 305
- amine derivatives 249
- 2'-aminoacetophenones 71
- amino-acid-based XB donor 47
- 1,3-aminoalcohols 132
- aminoalkyl-2-oxindole 79
- 3-aminoalkyl-2-oxindoles 78, 79
- 2-aminobenzofuran-3(2*H*)-ones 103
- 2-aminobenzothiazoles 105
- 2-aminobenzoxazole derivatives 77
- 2-aminobiphenyls 153
- aminofunctionalization 252
- aminonitrile 2-aminobenzoxazole derivatives 78
- aminonitrile skeletons 77
- aminooxylated oxindoles 103
- 2-aminopyridines 100, 101
- aminyl radical 77
- ammonium hypoiodite 74, 275
- ammonium salts 73, 122, 136
- aniline sulfonamides 16
- anti*-1,2-dichlorides 263
- anti*-1,2-difluorides 259
- anti*-electrostatic variants 33
- α -O-bound iodine(III) intermediate 277
- α -oxocarboxylic acids 87
- α -oxysulfonylation of ketones 277

- α -oxysulfonylation reactions 280
 - α -oxytosylation reaction 281
 - α -oxytosylations 190
 - α -phenyl-*N*-*tert*-butylnitrone (PBN) 289
 - α -phosphoryloxylation 357
 - aporphine scaffold 160, 161
 - aqueous ethanol 28
 - aqueous hexafluoropropan-2-ol 28
 - araldehyde *N*-acylhydrazones 107
 - arenesulfonic acids 277
 - ArI(OCH(CF₃)₂)₂ 347
 - Ar*I-catalyzed pathway 248
 - ArICl₂ 342
 - aromatic aldehydes 82, 85, 307
 - aromatic sulfonanilides 359
 - aryl acetylenes 363
 - aryl alkenes 85
 - 3,3'-aryl analogues 196
 - arylated products 163
 - arylcarboxyamides 73
 - aryl C(sp²)-C(sp²) coupling 157
 - aryl esters 90, 91
 - aryl ethers 74, 75, 264, 265
 - arylhydrazines 163
 - aryl-iodide-catalyzed alkene
 - difunctionalization reactions 244
 - aryl iodide-catalyzed enantioselective oxidative couplings 186
 - aryl iodide-catalyzed enantioselective oxidative rearrangement 251
 - aryl iodides 4, 253
 - aryl isothiocyanates 105
 - aryl methyl ketones 70
 - 4-arylmethyl-4-pentenoic acids 35
 - 2-arylphenylisonitriles 102
 - 3-arylquinoline-2-ones 160
 - 3,3'-aryl-substituted (*R*)-[H₈]BINOLs 202
 - 2-arylsubstituted piperidines 131
 - α -sulfonyloxy carbonyls 277
 - asymmetric catalysis through halogen bonding 50
 - asymmetric counterion directed catalysis (ACDC) 52
 - asymmetric dearomative coupling 213, 214
 - asymmetric hydroxylative phenol dearomatizations 190
 - α -tertiary amine stereocenters 253
 - atom economy 335
 - α -tosyloxy ketones 278, 279
 - α -tosyloxylation 357
 - α -tosyloxypropiophenone 278
 - atropisomeric binaphthyl-based chiral iodides 359
 - atropisomeric phosphinamide derivative 155
 - α , ω -diiodo-compounds 400
 - axial chiral spirobiindane 195
 - axially-chiral bidentate 2,2'-bipyridine-based XB donor 44
 - aza-Diels-Alder reaction 43
 - aza-[7] helicene 156
 - azaspirocyclohexadienones 81
 - azide-hypervalent iodine reagent combination 160
 - aziridines 80, 81
- b**
- Baeyer-Villiger oxidation 285
 - β -alkylcinnamamides 260
 - bambusuril macrocycle 125
 - Barluenga's reagent 122, 127
 - β -aryl alkyl iodanes 260
 - BASF acetic acid process 390
 - BASF process 388
 - β , β -difluorinated alkyl bromide building blocks 261
 - β -carbonyl sulfones 96, 98
 - β -dicarbonyl substrates 345
 - benzhydryl bromide 37
 - benzhydryl chlorides 37
 - benzimidazole derivatives 99, 171
 - benzimidazole fused heterocycles 155, 173
 - benzimidazoles 33, 155-157
 - benzimidazolium-derived ones 39
 - benzimidazopurine nucleosides 156
 - benziodoxoles 3
 - benzoate complexes 127
 - benzo[*c*]cinnoline compounds 173
 - benzocoumarin product 306
 - 1,4-benzodiazepines 153
 - benzo-furan-3(2*H*)-one 103
 - benzoic acid (BzOH) 338
 - benzoimidazolones 153

- benzosultams 153
benzothiazoles 171
benzoxazole radical 77
benzoxazoles 47, 77
benzoyl hypoiodite(I) species 137
benzoyl radical 73
benzyl alcohols 72, 251
benzylamines 101, 132
benzylated amides 109
benzyl benzoates 83
2-benzylbenzoic acid derivatives 136, 137
benzyl cations 82, 88
benzyl cinnamyl ether 249
benzyl compounds 76
benzyl esters 82, 83, 188, 261
benzyl ethers 188, 190, 195
benzylic alcohols 39, 85, 139
benzylic aldehydes 73
benzylic/allylic hydrocarbons 83
benzylic iodide 129, 137
benzylic primary alcohols 91
benzylic radical 71, 102
benzylic radical intermediate 96
1-benzyl-1,2,4-triazoles 76
 β -fluorinated aziridines 255
 β -fluoropyrrolidine product 255
 β -functionalization of alcohols 139–140
 β,γ -unsaturated ketoximes 102, 103
 β -(2-hydroxyphenyl)ketones 287
 β -hydroxy sulfones 140
 β -hydroxy thioethers 140
biaryl compounds 156
biaryl motifs 174
biaryl products 359
bicyclic tetrahydrofuran products 264
bidentate dicationic donor 37
bidentate dicationic organoiodine(I) XB donor 44
bidentate imidazolium 51
bidentate imidazolium based XB donors 51
bidentate iodine(III)-based XB donor 44
bidentate XB donor 44, 47
2,2'-binaphthalene 196
binaphthyl diiodide 281
binaphthyl ethers 190
binaphthyls 187, 197
1,1'-binaphthyl scaffolds 198
binaphthyl diiodide catalyst 254
BINOL-fused maleimide 202
binuclear iodine system 316
 β -iodo oxime 84
biphenyl-2-carboxylic acids 360
biphenyls 187
2,2'-bipyridine-based bidentate XB donor 47
bipyrroles 163
bis-acetoxyated product 249
bisallyl-functionalized pyridine derivatives 55
bis-amide catalyst 258, 259
bis-amide iodoarene catalyst 254
bis(imidazolium)-based bidentate chiral XB donor 52
bis(imidazolidine)-based compound 53
bis(iodoimidazolium) compound 44
bis(lactate)-derived bisamide 278
bis(benzhydryl)ethers 28
bis(saccharinato)iodate 135
bis(amidato)iodate complexes 125
[bis(hexafluoroisopropoxy)iodo]arenes 349
[bis(trifluoroacetoxy)iodo]arenes 341–342
[bis(benzoyloxy)iodo]benzene 123
[bis(trifluoroacetoxy)iodo]benzene (PIFA) 136, 341, 359
[bis(trifluoroethoxy)iodo]benzene 345
[bis(trifluoroacetoxy)iodo]toluenes 341
bis(heterocyclic)methanes 47
[bis(trifluoroacetoxy)iodo]benzene (PIFA) 152
 β -ketoesters 85, 100
black liquor 393
 β -lactams 369
 β -*N*-glycosides 55
BODIPYs 96
bond-forming processes 337
boron-doped diamond electrode produced IBX 349
boron trifluoride diethyl etherate 357
boron trifluoride etherate 252
bromobenziodoxolone 369

- 1-bromo-3-chlorobenzene 195
 2-bromo ethylbenzene 195
 4-bromiodobenzene 360
 bromolactones 368
 2-bromo-phenanthridinones 173
 11-bromo-1-undecanol 39
 Brønsted acid catalysis 27, 28, 30, 44
 Brønsted bases 48
 Brønsted/Lewis acids 244
 β -scission process 127
 β -substituted styrenes 254
 [Bu₄N][I(O₂CAr)₂] 130
 [Bu₄N][I(OAc)₂] 141
 butadienyl isocyanates 28
- C**
- caffeine 135
 camphorsulfonic acid (CSA) 164
 C₁- and C₂-symmetric derivative 187
 carbamates 354
 carbamoylphosphonates 110
 carbazole 348
 carbazole formation 347
 carbazole product 171
 carbazoles 155
 carbazolones 153
 carbofunctionalization 263
 carbon-carbon bond 3, 121
 carbon-centered radical 74, 88, 127, 129
 carbon-heteroatom bond 121
 carbon radical 70
 carbonyl α -functionalization 357
 carbonyl compounds 275
 carbonyl-stabilized anionic radical
 hypervalent iodine 142
 carboxamides 354
 carboxylic acids 82, 88
 carboxylic esters 91
 carboxyl, nitro, and chloro substituents
 342
 cascade bond formation 99
 catalysis
 alkene difunctionalization 140
 amination reactions 129–135
 asymmetric catalysis through halogen
 bonding 50–53
 β -functionalization of alcohols
 139–140
 C–F bond formation 139
 α -functionalization of carbonyl
 compounds 140–142
 halogen bonding 53–57
 by molecular iodine 28–34
 by organic halogen bond donors
 34–50
 oxygenation reactions 135–139
 catalytic alkene difunctionalization
 reactions
 aminofunctionalization 252–257
 carbofunctionalization 263–268
 dihalogenation 257–263
 general mechanistic considerations
 243–244
 oxyfunctionalization 244–252
 catalytic asymmetric dearomative
 couplings 215, 219
 catalytic β C–H amination 131
 catalytic enantioselective α -oxidation
 reactions 357
 catalytic enantioselective
 α -oxylactonization 280
 catalytic hypervalent iodine(III)
 electrocatalysis 370
 catalytic hypervalent iodine(III) reactions
 using electrophilic halides 367
 catalytic hypervalent iodine(III) reactions
 using O₂ 354
 catalytic hypervalent iodine(V) reactions
 using O₂ 356
 catalytic hypervalent iodine(III) reactions
 using oxone 363
 catalytic hypervalent iodine(V) reactions
 using oxone 364
 catalytic hypervalent iodine reactions
 using peracid oxidants 357
 catalytic intramolecular C–H aminations
 172
 cationic bidentate XB donor 41
 cationic idodobenzimidazolium
 derivatives 47
 cationic XB donors 33, 34
 Cativa process 11, 391
 C-3 benzylated 2*H*-indazoles 96

- C–C bond 93
- C₂-centered radical intermediate 84
- C₃-disubstituted oxoindoles 173
- central iodine(III) phenoxide 188
- C–F bond formation 139
- [C₆F₅I(OCOCF₃)₂] 163, 166
- chalcones 251
- C(sp²)-H amidation method 152
- C(sp³)-H amination 134
- C–H bond amination 76
- chiral amines 252
- chiral ammonium hypiodite-catalyzed
 - oxidative cyclization 287
- chiral ammonium iodides 5, 290
- chiral aryl iodide catalysts 185
- chiral aryl iodides 5, 185
- chiral azides 51
- chiral benzyl esters 188
- chiral benzyl ethers 195
- chiral bidentate iodoimidazolium-derived XB donor 41
- chiral bidentate XB catalyst 51
- chiral bifunctional ammonium iodide catalyst 290
- chiral binaphthyl-based quaternary ammonium iodides 287
- chiral binaphthyl corpse 311
- chiral hypervalent iodine compound 185
- chiral hypervalent iodine reagents 188, 247
- chiral hypervalent organoiodine(III) reagents 278
- chiral iodanes 185
- chiral iodine(III) reagent 245
- chiral iodoarene catalysts 185
- chiral iodoarene diacetate reagents 247
- chiral iodoarenes 278, 357, 359, 361, 367
- chirality, origin of 186
- chiral lactic acid-derived Ishihara-type precatalysts 20
- chiral Lewis base catalyst 15
- chiral Lewis basic amidophosphate catalysts 35
- chiral & λ³-iodane 197
- chiral organoiodine catalyst 283
- chiral organoiodine(III) catalysts 277
- chiral organoiodine(III)-catalyzed
 - enantioselective α-fluorination 281, 282
- chiral organoiodine(III) reagents 277
- chiral oxazoline-based catalysts 195
- chiral oxazolines 188, 193
- chiral pentanidium salts 52
- chiral phosphate catalyzed
 - enantioselective iodolactonization reaction 35
- chiral quaternary ammonium iodide 92
- chiral sulfones 195
- chiral thiourea catalyst 36
- chiral triazole-based iodoarenes 195
- chiral triazoles 51
- chiral XB donors 44
- 4-chloro-1-[bis(trifluoroacetoxy)iodo]benzene (4-CIPIFA) 152
- 1-chloroisochromane 39
- chlorophenylacetic acids 50
- 4-chlorostyrene 263
- chromanes 49
- chroman-4-ones 96
- chromenone-indole fused heterocycles 155, 156
- cinnamyl alcohol 246, 249
- cinnamyl ether substrates 246
- cinnolines 173
- C-iodonium enolate 284
- cis*- and *trans*-stilbene 311
- cis*-fused furanobenzopyrans 28
- C–N bond
 - amides 69–73
 - C–H amination 76–82
 - hemiaminal ethers 73–76
- Co-based catalytic carbonylation 389
- C–O bond
 - α-acyloxy ethers 86–87
 - α-acyloxy ketones 84–86
 - esters 87–93
 - ethers 87–93
 - via alkylarenes 82–84
- common alkyl iodane intermediate 247
- complex iodides 123
- concentrated HNO₃ 342
- conformationally flexible C₂-symmetric iodoarene catalyst 359

- conformationally flexible C_2 -symmetric
 iodosylarene catalyst 18
 conjugated carbonyl compounds 45
 C-radical intermediate 73
 CrO_3 342
 cross dehydrogenative coupling (CDC)
 83, 161, 166
 crucial saccharin radical 135
 crude tall oil (CTO) 393
 C–S bond 96
 C_2 -symmetric catalysts
 catalyst synthesis 201–202
 structural features 195–197
 x-ray structure analysis and
 computational investigations
 197–201
 C_2 -symmetric chiral iodoarenes
 200
 C_1 -symmetric iodoarene
 catalyst 281, 359
 catalyst synthesis 193–195
 ortho-effect 190–193
 structural features 187–190
 C_2 -symmetric iodoresorcinol catalysts
 198
 C_2 -symmetric 2-iodoresorcinols 188
 C_1 -symmetric lactic acid-derived methyl
 esters 193
 C_2 -symmetric lactic acid-substituted
 resorcinols 197
 cumene hydroperoxide (CHP) 12, 290
 C_3 -unsymmetric spirooxindoles 159
 2-cyanoacetic acid 78
 cyanoacetic acids 77
 cyanoacetic esters 85
 cyanocobalamin 92
 cyclic alcohols 127
 cyclic alkenes 363
 cyclic and acyclic α -silyloxyhalides 39
 cyclic β -ketoesters 304, 313
 cyclic carbonates 92, 249
 cyclic iodanes 338
 cyclic pentadienyl radical 93
 cyclized allylic enamines 311
 cyclized 1,2-diamine precursors 252
 1,3-cyclohexadiene 44
 cyclohexadiene lactone 231
 cyclohexenyl allylic radical 96
 cyclometalated products 55
 cyclopentadiene 43
 cyclopentanone- and succinimide-derived
 β -ketoesters 290
 cyclopentenone 303
 cyclopropane product 142
 cyclopropanes 96
 cyclopropenone intermediate 109
- d**
- dearomative spirocyclization 219
 decarbonylative aminyl radical 105
 dehomologized carboxylic acids 308
 dehydroabiatic acid 394
 dehydrogenative 2-electron oxidations
 186
 desilylative semipinacol rearrangement
 39
 Dess–Martin periodinane (DMP) 22,
 212, 299
 dehydrogenations with 303–305
 fragmentations with 307–309
 oxidations of alcohols with 302–303
 oxidative aromatizations and
 dearomatizations with 305–307
 synthesis of 300–301
 destabilization 191
 δ -hydroxyketone derivatives 289
 diacetone alcohol 27
 diacetoxyiodate 141
 diacetoxyiodate(I) reagents 126
 (diacetoxyiodo)arene 21, 353
 (diacetoxyiodo)benzene (PIDA) 1, 123,
 338, 339, 341
 diacetoxyated compounds 92
 diacetoxy products 246
 dialkylformamides 70, 71
 diamines 99
 1,3-diamines 132
 di- and tri-substituted cinnamate esters
 260
 1,3-diarylacetonones 108, 109
 diarylated/dialkylated iodine-centered
 ate-complexes 122
 diaryliodonium salts 1, 41, 166, 342, 396

- diarylketones 93
diaryl phosphinic acids 84
(diazidoiodo)benzene $\text{PhI}(\text{N}_3)_2$ 127
diazo derivatives 98
dibenzodihydro-1,3-diazepinone skeleton 157
dibenzooxazepines 305
dibenzothiazines 155
dibenzoxazepinone 153
1,2-dibromination of alkenes 369
1,3-dibromo-5,5-dimethylhydantoin (DBDMH) 48
(dibromoiodo)arenes 368
1,3-dicarbonyl 290
1,3-dicarbonyl compounds 79, 80, 93, 94, 281, 286, 289
1,4-dicarbonyl compounds 49
1,3-dicarbonyls 281
dicationic halogen-bond donors 43
(dichloroiodo)arenes 342
(dichloroiodo)benzene 1, 342
4-(dichloroiodo)toluene 368
Diels–Alder reaction 222
Diels–Alder-type cycloaddition 28
dienophiles 28
1,3-difluoride 249
1,2-difluorides 257
difluorinative Wagner–Merwein rearrangements 256
4-(difluoroiodo)anisole 370
(difluoroiodo)arenes 367
(difluoroiodo)benzene (PhIF_2) 281, 345
4-(difluoroiodo)nitrobenzene 345, 370
4-(difluoroiodo)toluene 345
difluoromethanesulfonyl chloride 99
difluoromethanesulfinic chloride 99
difluoromethanesulfonyl chloride 99
difluoromethylthiolated aromatics 96, 99
difluoromethylthiolation of indole derivatives 99
3,5-difluorotoluene 222
2,5-diformylfuran (DFF) 314
difunctionalization of unsaturated C–C bonds 360
dihalogenation 257
dihalogens (X_2) 14
dihydrojasnone 31
dihydronaphthalene 311
dihydrooxazines 250
dihydropyrans 304
dihydroquinoxalines 153
dihydroxerulin 305
1,2-diiodobenzene 355, 360
3,3'-diiodo-BINOL-based maleimides 196
4,4'-diiodo-1,1'-biphenyl 342
2,2'-diiodobiphenyl derivative 359
2,2'-diiodobiphenyls 174
diiododiene 202
1,1'-diiodonaphthalene 218
2,2'-diiodo-4,4',6,6'-tetramethyl-1,1'-biphenyl 360
diisopropylidene derivatives 31
diisopropyl lactamide analog 250
1,3-diketones 93
dimethanoanthracene-based aryl iodides 197
dimethanoanthracene catalyst 203
2-(dimethylamino)-1-phenylethanone 70
dimethylamino radical 70
dimethyl benziodoxole 168
dimethyldioxirane 309
5,5-dimethylhydantoin (DMH) 49
4,5-dimethyl-IBS precatalyst 318
3,5-dimethyliodobenzene 364
dimethyl sulfoxide (DMSO) 122, 125, 300, 350
1,2-diols 21
1,3-diones 100, 101
dioxygenase reactivity 336
dioxygenated products 88
diphenyldisulfane 99
diphenyliodonium perchlorate 346
direct C–H amination reaction 130
direct C–H functionalization reactions 166
 δ^2 -isoxazolines 84
distilled tall oil fatty acids (DTO) 393
1,1-disubstituted alkenes 251
1,2-disubstituted alkenes 254
2,2-disubstituted alkenes 256
2,2-disubstituted alkenyl substrates 253
disubstituted cinnamamides 260
1,2-disubstituted olefins 263

- 2,5-disubstituted 1,3,4-oxadiazoles 107
 1,2-disulfonimides 253
 6-di-*tert*-butyl-4-methylphenol (BHT) 28
 di-*tert*-butyl peroxide (DTBP) 139
 (*S*)-di-*tert*-butyl-thio-sulfinate 195
 dithioketals 370
 dithiophenes 163
 (ditrifluoroacetoxy)iodobenzene 341
 doubly unsaturated ketone 44
 dual organocatalytic system 21
 dye-sensitized solar cell (DSSC) 407–409
- e**
- electrochemically derived hypervalent iodine reagents 347, 349
 electrochemistry 337
 electron-deficient α,β -unsaturated carbonyl compounds 44
 electron-deficient β -substituted styrenes 259
 electron-deficient styrenes 256, 259
 electron-rich aromatics 44, 99
 electrophilic halides 14, 122
 electrophilic iodine(I) catalyst state 130
 electrophilic iodine reagents 121, 125
 electrophilic iodine(I) reagents 121
 electrophilic π -complex 244
 electrophilic perfluoroalkylations 3
 enamino esters 106
 enamines 94, 96
 enantio- and *syn*-diastereoselective 1,2-oxyfluorination 249
 enantiopure 1,2-diamines 253
 enantioselective α -azidation 290
 enantioselective α -oxytosylation 277, 278
 enantioselective α -tosyloxylation 357
 enantioselective cycloetherification reactions 289
 enantioselective hypervalent-iodine-catalyzed alkene difunctionalization reactions 244
 enantioselective iodocyclization 15
 enantioselective oxidative α -azidation 290
 enantioselective vicinal diacetoxylation 20
- 6-*endo-trig* intramolecular addition 93
 enol ester derivatives 278
 enol esters 278
 enones 139
 enzymatic oxidation reactions 335
 ephedrine derivatives 193
 epoxyindolenines 16
 esters 27, 87, 310
 ethers 87, 310
 3-ethoxyindoline 104
 ethyl acetoacetate 355
 ethyl acrylate 399
 ethylarenes 71
 Et₄NI-catalyzed synthesis 73
 Et₃N-5HF 345
 5-*exo-dig* cyclization 93
exo-selective sulfonyl- and phosphoryloxylactonization 249
- f**
- Favorskii amides 109
 Fe(acac)₃ 353
 flow chemistry 348
 fluorinated alcohol solvents 345
 fluorinated monomers 405
 fluorinated repellents 399, 400
 fluorination reactions 5, 362
 fluorine-based repellent 400
 fluoroalkyl substituents 352
 fluorobis(sulfonyl)-methane scaffold 47
 fluorocyclized products 367
 fluoroelastomers 401, 404
 fluoropiperidines 254
 fluorous hypervalent iodine compounds 337
 fluorous hypervalent iodine (III) reagents 352
 formamides 72, 77, 105
 FPIFA-BF₃ Et₂O system 163
 free alcohols 258
 Friedel–Crafts alkylation reaction 37
 Friedel–Crafts type spirocyclization 283
 functionalized [6.6.5] tricyclic frameworks 93
 furanes 142
 fused benzimidazoles 174

g

- γ - and δ -lactones 137
- γ -benzoyl- γ -butyrolactone 281
- γ -butyrolactone products 249
- gem*-dimethyl- and *gem*-dicarbomethoxy-substituted substrates 253
- geminal dihydroperoxides 31
- geminally difluorinated compounds 260
- glycosyl trichloroacetimidates 55
- glyoxal-derived substrate 51
- gold-catalyzed cycloisomerization reactions 56
- group transfer chemistry 337

h

- halocyclization 35
- halogenated pentanidium cations 52
- halogen-based Lewis acid catalysis 27
- halogen bond (HB) 14, 53
 - basicity scale 27
 - catalysis 14–15
 - donor 55
 - I₂-NBS adduct 131
 - interactions 14, 27
 - substituent 53
- (halo)imidazolium salts 43
- halo-Lewis acids 35
- halosuccinimide 15
- Hantzsch ester 43
- 1,6-HAT process 132
- 1-(9*H*-carbazol-9-yl)ethan-1-one 347
- 4*H*-chromen-4-ones 96
- helical chiral tetralin motif 203
- [7]helicene 202
- helicene-based chiral aryl iodides 197
- hemiaminal ethers 73
- hemiaminals 39, 73
- (hetero)aromatic compounds
 - hypervalent iodine mediated C–H amination reactions 164–166
 - hypervalent iodine mediated C–H (hetero)arylation 162–164
 - intramolecular C–C bond formation via oxidative cyclization 156–160
 - intramolecular C–N bond formation via oxidative cyclization 152–156
 - other direct C–H functionalization reactions 166
 - radical mediated intramolecular cyclization 160–161
- heteroaromatics 277
- heteroatom-iodine bonds 142
- hetero-biaryls 163
- heterocycle fused quinolinone derivatives 157
- heterocyclic alkaloids 130
- hexafluoroantimonates 397
- hexafluoroisopropanol (HFIP) 175, 263
- 1,1,1,3,3,3-hexafluoroisopropanol (HFIP) 211
- hexafluorophosphates 397
- hexahydroxytriphenylene (HHTP) 163
- 3-hexylthiophene 167
- H[I(O₂CAr)₂] 130
- highly catalytic enantioselective Kita oxidative spirolactonization 18
- highly functionalized azetidines 81
- highly oxygenated biaryls 163
- high-performance fluoroelastomers 400
- high-performance I⁺/H₂O₂ catalysis 289
- high-performance photoresists 397
- 1*H*-indazoles 171
- 2*H*-indazoles 96
- Hofmann–Löffler reaction 129–131
- Hofmann rearrangement chemistry 354
- homo- and cross-[4+2] cycloadditions 50
- homotryptamine derivatives 15, 16
- homotryptamines 15
- hot potash lye 1
- 1*H*-1,2,4-triazoles 75, 76
- hydrogen fluoride-pyridine (HF-pyridine) 249
- hydrogen peroxide 12, 15, 136, 276, 287, 289
- 1,5-hydrogen transfer (1,5-HAT) 129
- hydroiodic acid (HI) 11
- hydroquinone-derived
 - γ -(2-hydroxyphenyl)ketones 288
- hydroquinones 352
- hydroxide radical furnished oxonium ion 74
- hydroxy acetate 249
- 1-hydroxy-7-azabenzotriazole (HOAT) 86
- hydroxy(tosyloxy)iodine(III) polymers 350

- [hydroxy(tosyloxy)iido]benzene 3
 4-hydroxyisochromanones 247, 248
 hydroxymethylfurfural (HMF) 314
 1-hydroxy-*N*-aryl-2-naphthamides 225
 2-hydroxy-*N*-phenyl benzamides 157
 3-hydroxy-2-oxindoles 158
 3-hydroxyquinolinones 159
 hydroxy substituted oxazoline compounds 367
 hypervalent iodine(III) 136, 139, 357
 hypervalent iodine(III)/Ag(I) terminal oxidants 360
 hypervalent iodine catalysis 18, 275, 360
 hypervalent iodine catalysts 221
 hypervalent iodine catalyzed asymmetric transformations 151
 hypervalent-iodine-catalyzed enantioselective cyclization 249
 hypervalent iodine catalyzed intermolecular reactions 174
 hypervalent iodine catalyzed intramolecular cyclization reactions 171
 hypervalent iodine chemistry 2, 121
 hypervalent iodine compounds 2, 47, 337, 347, 353
 hypervalent iodine(V) compounds 299
 hypervalent-iodine-mediated alkene difunctionalization catalysis 252
 hypervalent iodine mediated C–H amination reactions 164
 hypervalent iodine mediated C–H (hetero)arylation 162
 hypervalent iodine mediated oxidative functionalization 158
 hypervalent iodine oxidations 3
 hypervalent iodine reagents 2, 151, 152, 211–215, 219, 228, 231, 233, 234, 252
 hypervalent iodine(III) reagents 155, 168
 electrochemical synthesis of 345
 synthesis with H₂O₂/UHP 341
 synthesis with O₂ 338
 hypervalent iodine(V) reagents
 electrochemical synthesis of 349
 synthesis from H₂O₂/UHP 343
 synthesis with O₂ 340
 hypervalent iodines 2, 3, 5, 18
 hypervalent iodine(III) species 4
 hypervalent iodotetralone 190
 hypervalent molecules 2
 hypervalent organoiodine derivatives 11
 hypervalent organoiodines 275
 hypervalent tetralone 188
 hypochlorous acid (HOCl) 342
 hypohalous acids 341
 hypoiodic acid 31
 hypoiodite 4, 127, 289
 hypoiodite-catalyzed α -azidation 290
 hypoiodite-catalyzed dearomative peroxycyclization 15
 hypoiodite-catalyzed tandem oxidative cyclization
 coupling reactions 16
 epoxidation reactions 17
 hypoiodite/hypervalent iodine active species 4
 hypoiodite salts 11, 12, 15
 hypoiodite species 136
- i**
- IBX-amides 313
 IBX-esters 313
 IBX-ethers 313
 imidazo[1,2-*a*]pyridines 100, 101
 imidazo[1,5-*c*]-quinazolines 101, 102
 imidazoles 277
 imidazolium 51
 imidazolium-based monodentate XB donors 39
 imidazopyridines 166
 imidazopyrimidines 155, 157
 iminium salt 70
 iminoxyl radical 84
 iminoxyl radicals 102
 immobilized I(V)-based material 350
 indalone 195
 indanole-based catalysts 188
 indanone- and tetralone-derived β -ketoesters 290
 indanone-derived β -ketoesters 281, 283
 indene 311
 indol 28
 indole-based diene 306
 indole derivatives 98, 153

- indolizines 142
- indolo[2,3-*b*]quinolines 16
- indoloquinolinones 153
- indolyl-tetrahydroquinoline derivatives 50
- iodine(III)–iodine(I) reduction 185
- inorganic iodine-based catalysis 286
- inorganic iodine catalysis 285
- inorganic iodine-catalyzed oxidative transformations 277
- in situ* generated ammonium hypoiodite species 285
- in situ* generated (diacetoxyiodo)benzenes 357
- in situ*-generated chiral hypervalent iodine(III) species 18
- in situ* generated IBS 23
- in situ* generated iodanes 185, 187
- in situ* generated iodine chloride 35
- in situ* generated iodine(III) reagents 364
- in situ* generated peracetic acid 350
- in situ* (hypo)iodite species 136
- intermediary alkyl iodide(I) 133
- intermediary benzylic radical 131
- intermediary benzyl iodide 131
- International Conference on Hypervalent Iodine Chemistry (ICHIC) 3
- intra- and intermolecular oxidative α -C–O coupling (α -oxyacylation) reactions 285
- intramolecular C–C bond formation via oxidative cyclization 156
- intramolecular C–H/N–H coupling 153
- intramolecular C–N bond formation via oxidative cyclization 152
- intramolecular condensation reaction 157
- intramolecular hydrogen bonding 221
- ioda(III)cyclobutene 142
- iodane-bound nucleophile 185
- iodane mediated heterocycle synthesis 153
- iodane-nucleophile complex 185
- iodate-initiated radical cyclopropanation reactions 141
- iodic acid (HIO₃) 137
- iodide-promoted active cobalt catalyst [HCo(CO)₄] 388
- iodinated substrates 121
- iodine
 - catalysts 3
 - discovery and early studies 1
 - research in the 20th century 2
 - research in the 21st century 3
- iodine(V)-based catalysts 22
- iodine-based interhalogen compound 39
- iodine-based redox organocatalysis 275
- iodine(I)-based XB donor 49
- iodine(III)-based XB donor 49
- iodine(III)-bound ligands (TFA) 285
- iodine bromide (IBr) 4
- iodine catalysis
 - dye-sensitized solar cell (DSSC) 407
 - photo initiators 396
 - polyamide stabilizer 409
 - polymerization 399
 - synthetic acetic acid 387
 - tall oil 393
- iodine(I) catalysis 15
- iodine(III) catalysis 17
- iodine(V) catalysis 22
- iodine catalysts 3
- iodine-catalyzed amination reactions 129
- iodine catalyzed β C–H amination 131
- iodine(III) catalyzed
 - bromocarbocyclization 173
- iodine catalyzed Csp³–H/S–H coupling 139
- iodine catalyzed Hoffmann–Löffler reaction 132
- iodine(I)-catalyzed oxidative transformations 17
- iodine(III) catalyzed synthesis 174
- iodine(I) complexes
 - from oxidation of low-valent iodine 123
 - polymer bound reagents 125
 - synthesis via complexation of neutral precursors 122
- iodine(V) compounds
 - catalytic reagents in organic syntheses 314

- recyclable reagents in organic syntheses 311
- as stoichiometric reagents in organic syntheses 300
- iodine(III) derivatives 37
- iodine (III)-derived XB donors 37
- iodine(III) oxidant 123
- iodine pentafluoride (IF₅) 399
- iodine(I)-promoted C–H amination reaction 135
- iodine(III) reagent catalyzed C–H cycloamination 174
- iodine(I) reagents 123
- iodine(V) reagents 23
- iodine(III)/ruthenium(II)-electrocatalyzed C–H functionalization 370
- iodine transfer polymerization (ITP) 399, 405
- iodine trichloride 1
- iodite 74
- 2-iodoacetonitrile 77
- iodoamino intermediate 79
- 2-iodoanisole 250
- 4-iodoanisole 355
- iodoarene 278, 360, 363
- iodoarene catalysis 171
- iodoarene catalyst 185, 256, 260, 261, 362
- iodoarene-catalyzed aerobic glycol cleavage 354
- iodoarene difluoride reagent 254
- iodoarenes 5, 21
- iodoaryl amides 193
- iodoaryl-phosphine ligand 53
- iodobenzene 5, 123, 176, 232, 277, 338, 344–346
- 2-iodobenzenesulfonate 364
- 2-iodobenzimidazolium salt 55
- iodobenzoate compounds 348
- iodobenzoates 347
- 2-iodobenzoic acid 22, 316, 344, 349, 364
- 2-iodo-binaphthyl-derived catalyst 195
- 2-iodo-1,3-dicarbonyl compounds 142
- 3-iodo-2,3-dihydrobenzofuran 89
- 1-iodoethylbenzene 133
- iodoimidazolium XB donors 43
- 2-iodo-imidazolium based tetrapodal halogen bond donor 47
- iodomesitylene 360
- 2-iodo-3-methylbenzoic acid 193
- 1-iodo-4-nitrobenzene 172
- 4-iodonitrobenzene 345, 370
- iodonium salts 151, 347
- iodonium ylides 49, 96, 140, 142, 151
- iodonium(III) ylides 49
- (*E*)-2-iodo-*N,N'*-diphenylbenzimidamide 368
- iodoperfluoroalkane 41
- iodoperfluoroalkanes 14
- (4-iodophenyl)(phenyl)iodonium perchlorate 346
- 2-(iodophenyl)propanoic acid 195
- iodophenylsulfonate isomers 347
- iodophenylsulfonates 347, 364
- iodosobenzene (PhIO) mediated 3-arylation 163
- iodoso compound 137
- iodosylbenzene 1, 337
- iodotetralones 188
- 4-iodotoluene 4, 345, 346
- iodotriphenylphosphonium iodide 99
- 2-iodoxybenzenesulfonic acid (IBS) 5, 23, 316, 365
- 2-iodoxybenzoic acid (IBX) 1, 22, 212, 299, 344
 - dehydrogenations with 303
 - fragmentations with 307
 - oxidations of alcohols with 302
 - oxidative aromatizations and dearomatizations with 305
 - synthesis of 300
- iodylarenes 299
- iodyl arenes (ArIO₂) 309
- iodylbenzene 1, 340, 344
- Ipy₂BF₄ 122, 127
- iridium catalyst 11
- iridium-catalyzed carbonylation 11
- I⁺/ROOH catalysis 289
- isatin compounds 71
- Ishihara catalyst 220, 223
- Ishihara-type catalysts 231, 245, 247, 249–251, 255
- Ishihara-type iodoarene 258, 263

- isobutyl vinyl ether (IBVE) 41
isobutyraldehyde 21
isobutyraldehyde autoxidation conditions 354
isocyanides 73
2-isocyanylbiphenyls 160
isolable disazidoiodate(I) species 126
iso-Nazarov cyclization 31
isoxazoles 364
isoxazoline-functionalized isoquinolines 103
isoxazoline functionalized phenanthridines 102
isoxazolines 364
ITP-derived fluoroelastomers 400
- k**
KClO₃ 342
kendomycin 306
ketocarboxylic acids 280, 285, 286
ketones 27, 196, 202, 354
ketophenols 92, 287
kinetic isotope effect (KIE) experiments 267
Kita spirolactonization 196, 218, 226
Kita-type chiral spirobiindane catalyst 228
KMnO₄ 342
Koser's reagent 339
Kraft pulping process 394
- l**
lactamides 199, 201
lactams 153
lactate-derived bis-*tert*-amide 285
lactic acid 193
lactic-acid derived Ishihara-type catalyst 246
lactones 85, 137, 358, 360
lactonizations 190
lanthanide complexes/*n*-Bu₄NI 93
Latimer diagrams 11
Lewis acid 4, 14
Lewis acid catalysis 27
Lewis acidic *N*-haloimides 35
Lewis basic ligands 186
Lewis basic triphenyl phosphine sulfide 15
Lewis/Brønsted acids 18
ligand coupling 4
ligand exchange 4, 126
λ⁵-iodanes 299
(+)-lycoricidine 303
- m**
magnetic nanoparticle-supported iodoarene 351, 352
maleimides 202
malonates 85
malononitrile 53
Mannich-type reactions 30
marinoquinoline 161
m-chloroperbenzoic acid (*m*-CPBA) 12, 15, 20, 287, 357
5-membered heterocycles 129
5-membered pseudocyclic iodanes 193
3-membered ring aziridinium 254
5-membered ring dioxooxathiazolidinium intermediate 254
Me₃SI 123
mesityl-2,6-diphenylpyrylium tetrafluoroborate (MDPT) 355
9-mesityl-10-methyl acridinium 171
meta-chlorobenzoic acid (*m*-CBA) 129, 275
meta-chloroperoxybenzoic acid (*m*-CPBA) 171, 176, 275
metal based Lewis acids 49
metal-free oxidants 337
metal/*n*-Bu₄NI catalytic systems 93
meta-substituted dicationic donors 37
methacrylamide derivatives 369
methallyl aryl ether 265
methanol feedstock 4
4-methoxy 347
3-methoxy benzaldehyde 195
5-methoxyindole 49
3-methoxyindolines 104
methoxy-substituted derivative 225
methyl 3-amino-2-naphthoate 195
methylarenes 76, 77
methylated arenes 96

- methylene blue (MB) 168
 methylene-bridged bis-1,3-dicarbonyl
 compounds 93, 94
 methylenecyclopropanes 92
 5-methyl-2-iodobenzenesulfonate 365
 (4-methylphenyl)(phenyl)iodonium
 perchlorate 346
 4-methylquinazolines 101, 102
 methyl vinyl ketone (MVK) 43, 44
 Miyamoto–Uchiyama protocol 21
 molecular iodine 14, 28, 139
 molecular orbital theory 125
 monocarbonyl systems 51
 monocationic XB donors 37
 monodentate halo(benz)imidazolium
 catalyst 49
 monodentate iodobenzimidazolium
 derivatives 44
 monodentate iodo(benz)imidazolium
 triflates 43
 monodentate pyridyl- and
 iodo(tetrafluoro)aryl-substituted
 phosphines 53
 monodentate XB donors 50
 monomeric quinol product 366
 mono-*N*-bromo-5,5-dimethylhydantoin
 (MBDMH) 49
 Monsanto process 390
 Morita–Baylis–Hillman products 316
 μ -oxo iodine(III) species 360
 Mukaiyama aldol reactions 30, 51
 Mukaiyama–Michael reactions 30
 Mukaiyama–Michael-type addition 43
 multicationic XBs 37
 multifunctional iodotriazolium-based XB
 donor 51
 multiwalled carbon nanotubes (MWCNT)
 351
- n**
- Nachtsheim's catalyst 281
 NaClO₂ 342
N-acyl amine 203
N-acylhydrazones 307
N-acylorthoamides 55
N-acyloxymethylamides 87
N-alkoxyamides 91
N-alkyl derivatives 369
N-allylamides 367
N-allylbenzamides 345
N-aminophthalimide 81
N'-anilidene acetohydrazine 355
 naphthalene ring 225
 naphthol
 asymmetric dearomative
 spirocyclization of 222
 asymmetric Kita spirocyclization of
 220
 carboxylic acid 218
 2-naphthol-1-carboxylic acids 221
 naphthol derivatives 216
 2-naphthole 195
 naphtholic sulfonamide amine 225
 1-naphthols 190, 202
 naphthol sulfonamide 225
 1,2-naphthoquinone 306
N-aryl acetamides 167
*N*⁶-aryl adenosine derivatives 156
N-aryl amide 153
N-aryl-2-aminopyridines 173
N-arylation 347
 (*N*-aryl-carbamoyl)-2-iminoacetates 81
N-arylimidines 173
 Na₂S₂O₈ 342
 Nazarov cyclization 31
N-benzyl-2-aminopyridines 155
N-(biphenyl)pyridin-2-amines 155
N-([1,1'-biphenyl]-2-yl)acetamide 347
N-Boc α -ketiminoesters 53
N-Boc imines 53
N-bromosuccinimide 122
N-bromosuccinimide (NBS) 14
n-Bu₄NCl 41
n-Bu₄NI 70
n-Bu₄NI-catalyzed α -aminoxylation of
 ketones 86
n-Bu₄NI catalyzed oxidative C–O bond
 formation 85
n-Bu₄NI-catalyzed protocol 83
n-Bu₄NI-catalyzed synthesis 70, 72, 92
n-Bu₄NI/H₂O₂-mediated intramolecular
 oxidative amination 78

- n*-Bu₄Ni mediated metal free approach 94
n-Bu₄Ni/TBHP catalytic system 98
n-Bu₄Ni/TBHP-catalyzed approach 83
n-Bu₄Ni/TBHP catalyzed C–N bond formation protocol 76
n-Bu₄Ni/TBHP catalyzed cross-dehydrogenative coupling 75
n-Bu₄Ni/TBHP-catalyzed direct amination 77
n-Bu₄Ni /TBHP catalyzed oxidative coupling of alcohols 83
n-Bu₄Ni/TBHP-catalyzed protocol 77
n-Bu₄Ni/TBHP mediated coupling 77
n-Bu₄Ni/TBHP mediated cross dehydrogenative coupling (CDC) reaction 85
n-Bu₄Ni/TBHP mediated oxidative esterification 82
n-Bu₄Ni/TBHP oxidative system 89
n-Bu₄Ni/TBHP system 77
n-Bu₄Ni/*t*-BuOOH-catalyzed alkylation reaction 96
N-centered succinimidyl radical 131
N-cinnamyl sulfonamides 48
N-(1,3-dioxoisindolin-2-yl)acetamide 371
neutral acylhypoiodite 125
neutral multidentate XB donors 34
neutral XB-catalyzed enantioselective reactions 54
N-fused spiroactams 355
N-heterocycle-stabilized organoiodines (NHIs) 280
N-hydroxybenzotriazole (HOBT) 86
N-hydroxyimides 86
N-hydroxyphthalimide (NHPI) 83, 86, 103, 133, 137
N-hydroxysuccinimide (NHSI) 86
nicotine 130
N-iodophthalimide derivative 36
N-iodopyridin-2-amine 105
N-iodosaccharin (NISac) 39
N-iodosuccinimide (NIS) 37, 122
nitrile oxides 364
nitrilium intermediate 73
nitro compounds 310
nitrogen-centered radical 129
nitrogen-containing aromatics 305
nitrogen-containing heterocycles 307
nitroolefins 101
nitrostyrene 49
N-mesityl lactamide Ishihara-type catalyst 249
N-methoxy-3-(4-methoxyphenyl)propenamide 355
N-methoxy-4-methyl-*N*-phenylbenzene sulfonamide 355
N-methyl 4-iodopyridinium triflate 48
N,N-dialkylformamides 71
*N*¹,*N*³-diarylmalonamides 283
N,N-dimethyl lactamide groups 250
non-aromatic cyclic precursors 305
non-biaryl atropisomeric diiododienes 197
non-chiral aryl iodides 185
non-coordinating BAr₄^F anions 44
non-coordinating counterions 43
noncyclic phenolic carbocyclic acid 231
non-dehomologized carboxylic acid 309
N-oxo-phthalamide 137
N-oxy-amides 355
N-phenylacetamides 159
N-phenylimidazol-2-yl (*Z*) group 287
N-propargyl amides 367
N-propargyl carboxamides 364
[NR₄][Br(NSuccin)₂] 122
N-substituted amides 152
N-substituted anilines 77
N-substituted sulfoximines 353
N-sulfonyl cinnamyl amines 255
N-Tetrabutylammonium bis(acyloxy)iodate(I) [NBu₄][I(OAc)₂] 123
nucleofugacity 130
- O**
- o*-acylphenols 103
o-aminobenzamide 107
o-bonded iodane intermediate 278
o-bonded iodine(III) intermediate 282
o-cinnamyl phenyl ethers 48
o-iodoanisole 367
o-iodobenzamide 369

- o-iodobenzoic acid 300
 - o-iodonium enolate 284
 - o-iodophenol derived lactate ethers 188
 - Olah's reagent 258
 - o-nucleophiles 167
 - o-quinols 366
 - organic halogen bond donors 34, 41
 - organic iodides RI 4
 - organic iodine(III) and iodine(V) compounds 1
 - organic waste 311, 313
 - organic-XB-donor-catalyzed Mukaiyama-aldol reaction 47
 - organo-catalyzed controlled polymerization (OCCP) 401
 - organohalides (X-L) 14
 - organohalogen XB donors 56
 - organohypervalent iodine reagents 2, 3
 - organoiodine 282
 - organoiodine(III) catalysis 275–277
 - organoiodine(III) catalysts 277, 280
 - organoiodine-catalyzed α -C–O coupling of carbonyls 277
 - organoiodine(III)-catalyzed α -fluorination 281
 - organoiodine(III)-catalyzed alkene difunctionalization reactions 20
 - organoiodine(III)-catalyzed α -oxidative coupling 277
 - organoiodine(III)-catalyzed α -oxytosylation of ketones 277
 - organoiodine-catalyzed enantioselective α -oxytosylation 278
 - organoiodine(III)-catalyzed enantioselective intermolecular α -oxyacylation 280
 - organoiodine(III)-catalyzed enantioselective oxidative α -C–C coupling 283
 - organoiodine(III)-catalyzed oxidative coupling reactions 285
 - organoiodine(III)-catalyzed oxidative transformations 18
 - organoiodine(III)-catalyzed oxylactonization 285
 - organoiodine-catalyzed reactions 286
 - organoiodine chain transfer agents 406
 - organoiodine(III) compounds 18
 - organoiodine(III)/peracetic acid catalysis 285
 - organoiodines(III) 18
 - organophosphorus compounds 84
 - organo-photocatalyst MesAcr 171
 - ortho*-alkenyl benzoate esters 247
 - ortho*-arylbenzenesulfonamides 153
 - ortho*-effect 190
 - ortho*-iodophenol 193
 - ortho*-methyl-substituted iodane 193
 - ortho*-phenylenediamine 306
 - ortho*-substituted amide 191
 - ortho*-substituted derivative 191
 - ortho*-substituted iodane 193
 - ortho*-substituted iodoarenes 368
 - ortho*-substituted phenols 366
 - ortho*-substituted spirobiindane backbone 359
 - ortho*-unsubstituted derivative 203
 - oxa-aza spirobicycles 81
 - oxazoles 277
 - oxazole syntheses 347
 - oxazoline compounds 367
 - oxazolines 202, 250
 - oxazoline-substituted iodoarenes 192
 - oxidation reactions 335
 - oxidation state 185
 - oxidative addition 4, 12
 - oxidative C–H coupling chemistry 359
 - oxidative cleavage reactions 363
 - oxidative cyclization 153
 - oximes 84
 - oxo-bridged hypervalent iodine species 171
 - oxo-carboxylic acids 85
 - oxoindoles 174
 - Oxone[®] 5, 12, 15, 171, 287, 301, 309, 315
 - oxonium 74
 - 5-oxo-5-phenylpentanoic acid 280
 - oxyfunctionalization 244
 - oxygenation reactions 135, 360
 - oxygen gas 12
- p**
- paracyclophane 188
 - [2,2]paracyclophane 283

- paracyclophane-derived catalysts 195
2,2-paracyclophane-derived iodoarene 190
para-substituted counterparts 37
pendant nosylamides 256
pentacoordinate acetyl complex
 $[(\text{CH}_3\text{CO})\text{Rh}(\text{CO})\text{I}_3]^-$ 390
pentafluoroethyl iodide ($\text{C}_2\text{F}_5\text{I}$) 399
pentafluoriodobenzene 47
pentafluorophenyl group 47
pentamethyliodobenzene 21, 354
pentavalent iodanes 186
pentavalent iodine compounds 299
pent-4-enamines 254
4-pentenoic acids 249
peracetic acid (AcOOH) 171, 284, 336, 339, 361
peracid-based oxidants 360
peracid-based oxidation of iodoarenes 341
peracid oxidants 357
peracids 12, 341
perfluoro-alkyl iodides 36, 399
(perfluoroalkyl)iodocompounds 399
perfluoroalkyl radicals 36
perfluoroalkyl-substituted ammonium iodide 288
peroxides 85
peroxytetrahydropyridindolenines 15
(*S*)-pestalotiopsones 305
phenacyl radical 70
phenanthridines 94, 95
phenanthridinones 172, 173
phenol alcohols 224
phenol dearomatizations 190, 211, 213
phenolic lactone 231
phenolic oxidation reactions 216
phenolic substrates 4
phenols 229, 232, 351, 357
phenyliodine(III) carboxylates 2
phenyliodine(III)diacetate (PIDA) 211
 $\text{PhI}(\text{O}_2\text{CCF}_3)_2$ 339
 $\text{PhI}(\text{OAc})_2$ 92, 341, 344
 $\text{PhI}(\text{OBz})_2$ 339
 $\text{PhIO}/n\text{-Bu}_4\text{NI}$ -mediated oxidative cyclization protocol 81
phosphate esters 83
phosphine/*n*- Bu_4NI oxidative system 99
phosphine oxides 310
phosphonium salts 123
phosphoramides 110
phosphoric acid 49
phosphorus nucleophiles 84
phosphoryl anion 110
phosphoryl compounds 110
photoacid generators (PAGs) 396
photocatalytic C–H trifluoromethylations 170
photoinduced aerobic iodoarene catalysis 22
photo initiators 396
phthalimide (NPhth) 153
phthalimide derivative $[\text{NBu}_4][\text{I}(\text{NPhth})_2]$ 123
phthalimides 258
PIDA 212
PIDA-benzoyl peroxide (BPO) 161
PIFA 211, 212
PIFA-TMSN₃ system 168
pigment dispersants 404
pimaric acid 394
p-iodobenzoic acid 350
p-iodophenylacetic acid 350
planar chiral iodoarenes 188, 190, 283
p-nitro substituted derivative 345
P–O/C, S–N bond formation 109
polyamide 6 409
polyamide 66 409
polyamide stabilizer 409
poly[(aminomethyl)styrene] 350
polychloromethyl styrene 351
poly-(diacetoxyiodo)(α -methylstyrene) 350
poly-(diacetoxyiodo)styrene 350
poly[4-(diacetoxyiodo)styrene] 350
polyester fiber 387
polyethylene glycol 304
polyethylene terephthalate (PET) 387
polyfluorinated alkyl/aryl moieties 33
polyketide metabolite monocerin 247
polyketide natural products 247
polymer-bound IBX derivatives 312
polymer bound reagents 125
polymerization 399

- polymer-supported (diacetoxyiodo)arenes 350, 351
 polymer-supported hypervalent iodine reagents 337
 polymer-supported hypervalent iodine(III) reagents 350
 polymer-supported hypervalent iodine(V) reagents 350
 polymer-supported iodine reagent 127
 polymer-supported iodoarene 352
 (polystyrene-based) Merrifield resin 312
 polyvalent iodanes 151
 polyvalent iodine 1
 polyvalent organoiodine compounds 1, 2
 potassium iodate 1
 potassium persulfate 15, 287
p-phenol dearomatizations 188
p-quinols 364
p-quinones 351, 352, 363
 Prevost deoxygenation of alkenes 122
 primary amides 73
 Prins and Nazarov cyclizations 31
 prolanyl lactamide 201
 propiophenone 203
 pseudocyclic hypervalent iodine(V) compounds 311
 pseudocyclic reagents 220
 pseudocyclic systems 299
 and iodylarenes 309, 310
 pseudoephedrine-derived iodoarene catalyst 281
p-toluenesulfonic acid 300, 357
p-toluenesulfonic acid monohydrate 350
 purines 75, 76
 putative sulfonamidyl radical 130
 pyrazoles 277
 pyridine 125
 pyridinesmbkcircle 9HF 258
 pyridine-phosphine ligand 53
 pyridines 188, 305
 pyridine-substituted benzyl ethers 188
 pyridinium chlorochromate (PCC) 303
 pyridobenzimidazoles 155
 pyrido-fused 1,2,4-thiadiazoles 105
 pyrroles 305
 pyrrolidine product 129
 pyrrolidines 129
 3,2'-pyrrolidinylinspirooxindoles 78, 79
 pyrrolin-4-ones 106
 pyrrolobenzoxazinones 360
 pyrylium photocatalyst 21
- q**
- quaternary ammonium hypiodite catalysis 15
 quaternary ammonium iodides (R₄NI) 69
 quaternary ammonium (hypo)iodites 92
 quaternary ammonium substituted 4-iodoarenes 347
 quinazolines 305
 quinazolinones 106
 quinazolin-4(3*H*)-ones 107
 quinidine-based chiral Brønsted base 53
 quinoline derivatives 41
 quinoline *N*-oxide derivatives 168
 1,2-quinones 365
 quinoxalin-2-ones 94, 95
 quinoxalin-2(*H*)-ones 163
 quinuclidine 27
- r**
- racemic, catalytic 1,2-difluorination protocol 258
 racemic Favorskii amides 108
 radical mediated intramolecular cyclization 160
 radical reactivity 127
 R-cyano R-TMS/aryl-capped alkynyl aryl ketones 93
 reactive ArI(III) reagent 244
 reactivity
 ligand exchange reactions at iodine 126
 radical 127
 reagent recycling 337
 recyclable hypervalent iodine reagents
 fluorous hypervalent iodine (III) reagents 352
 polymer-supported hypervalent iodine(III) reagents 350
 polymer-supported hypervalent iodine(V) reagents 350

- recyclable polyisobutylene-bound iodine(V) reagent 313
 - redox-active supporting electrolytes 347
 - reductive elimination 4, 12
 - regioisomeric acetoxy alcohols 246
 - resin-bound hypervalent iodine(V) compounds 313
 - resorcinol-based aryl iodides 197
 - resorcinol-based lactamide 202
 - resorcinol-based lactic acid derivatives 201
 - resorcinol-based mesitylamide 202
 - resorcinol-based structures 197
 - resorcinol-derived catalyst 283
 - resorcinol-derived C_2 -symmetric chiral catalysts 283
 - resorcinol-derived reagent 245
 - rhodium based homogeneous liquid-phase catalyst $[RhI_2(CO)_2]$ 390
 - rhodium catalyst 11
 - Ritter type amination 137
 - rotaxanes 125
 - Ru complex photosensitizers 407
- S**
- saccharide derivative $[NBu_4][I(NSacc)_2]$ 123
 - Schreiner's thiourea 37, 49, 55
 - secondary alkyl halides 37
 - secondary amines 109
 - Selectfluor 14, 20, 246, 367
 - selectfluor/*n*-Bu₄NI catalyzed Csp³-H oxidation 84
 - silica-immobilized IBX reagent 350
 - silver fluoride (AgF) 345
 - silver trifluoroacetate 341
 - silyl enol ethers 30, 39, 49
 - silyl nucleophiles 30
 - Simonini complex AgI(OAc)₂ 122
 - six-membered fluorinated tetrahydropyrans 257
 - S_N2'-type reductive elimination 278
 - Society of Iodine Science (SIS) 3
 - sodium 4,5-dimethyl-2-iodobenzene sulfonate 366
 - sodium hypochlorite 309
 - sodium 5-methyl-2-iodobenzenesulfonate 365
 - sodium perborate 253
 - sodium percarbonate 15, 287
 - sodium periodate 309
 - sodium sulfonates 109
 - solid-supported iodoarene catalysts 351
 - spirobiindane catalyst 202
 - spirobiindanes 187, 190, 195, 198, 202, 217, 218
 - spirocycle 357
 - spirocyclic amide 225
 - spirocyclization 357
 - spironolactones 216, 218, 225
 - spirooxindole 359
 - spiroxindoles 158
 - squaramide 48
 - stereodefined 3-fluorochromanes 265
 - stilbenes 93
 - stoichiometric chiral oxidants 185
 - stoichiometric cooxidants 12
 - stoichiometric endo-selective tosyloxy- and acetoxy-lactonizations 247
 - stoichiometric *m*-chloroperoxybenzoic acid 4
 - stoichiometric metal-based oxidants 337
 - stoichiometric oxone 22
 - structurally diverse ketones 286
 - styrene derivatives 140
 - 2-substituted benzoxazoles 171
 - substituted 2-cyclopentenones 31
 - 2-substituted-2*H*-indazoles 96
 - 2-substituted iodoarenes 338
 - 4-substituted iodoarenes 338
 - substituted 1,3,4-oxadiazole 355
 - substituted oxazoles 364, 367
 - 4-substituted phenolic derivatives 358
 - 3-substituted thiophenes 163
 - sulfenium ion intermediate 163
 - 3-sulfenylindoles 96, 98
 - sulfonic acids 98
 - sulfonamides 109, 310
 - sulfonamidyl radical 130
 - sulfonate esters 310
 - sulfone-substituted iodobiphenyls 190
 - sulfonyl hydrazides 98

- sulfonyl radicals 98
 sulfoximines 353
 superabsorbent polymer (SAP) 405
 symmetry 187
syn-diacetylated product 247
syn dichlorides 263
syn-1,2-difluorides 259
syn-preorganized dicationic XB donor 44
syn-preorganized iodine(I)-based XB donor 49
 synthetic acetic acid 387
- t**
- tall oil 393
 tall oil fatty acids (TOFA) 393
 tall oil pitch (TOP) 393
 tall oil rosin (TOR) 393
 TBHP/*n*-Bu₄NI 85, 96
 telogen 399
 telomer 399
 telomerization 399
 terephthalic acid (PTA) 387
 terminal oxidant 335
tert-alkyl fluorides 139
tert-butanol 139, 251
tert-butoxyl 70, 71, 76, 90, 106
tert-butyl ester derivative 246
tert-butyl hydroperoxide (TBHP) 12, 70, 86, 136
tert-butyl peresters 89
tert-butyl peroxybenzoate (TBPB) 82
tert-butylperoxy radicals 70, 90, 106
 (2-*tert*-butylsulfonyl)iodobenzene 356
 (2-*tert*-butylsulfonyl)iodylbenzene 356
tert-crotonophenone 28
tert-1,2-diphenyl ethylene diamine 51
 tertiary alcohols 23
 tertiary aliphatic amines 93, 94
 tertiary alkyl (*t*-butyl, and *t*-amyl) iodides 28
 tertiary allylic alcohols 251
 tertiary amides 199
 tertiary amines 71
 tertiary aminourea 36
 tertiary azides 79
 tetraalkylammonium iodide 287, 289
 tetraalkylammonium succinimide 122
 tetrabutylammonium carboxylate 125
 tetrabutylammonium iodide (TBAI) 16, 69, 136, 140, 286, 337
 tetrahydrofuran-fused isochromanones 247
 tetrahydrooxazepines 250
 tetrahydropyridoindoles 15, 16
 tetrahydroquinolines 49
 tetraketone 303
 tetraphenylphosphonium monoperoxosulfate (TPPP) 316
 tetrazoles 74
 thermoplastic elastomers (TPEs) 400
 1,2,4-thiadiazole 105, 106
 thiazoles 277
 thioketals 31
 thiophene derivatives 44
 thiophenols 30, 139
 thiourea 48
 thiourea-based HB catalysis 48
 thiourea-I₂-based strategy 35
 three-centered-four-electron I–L bonds 337
 tocopherols 288
 tocotrienols 288
 Togni's reagent 94, 168
 toluene derivatives 83–85
 toluene–water 223
 tosylates 258
 tosyl-protected hydroquinone-derived γ -(2-hydroxyphenyl)ketones 288
trans- β -methyl styrene 254
 transient halogen bonding 35
 transient iodanyl radicals 339
 transition metal-catalyzed chemistry 337
 transition metal-free photocatalytic C–H trifluoromethylation 168
 transmetalation 12
 1,2,4-trialkyl substituted carbazoles 175
 triazole-based chiral iodoarene 226
 triazoles 33, 188
 1,2,3-triazoles 33
 triazole-substituted aryl iodide 280
 triazole-substituted chiral iodoarene catalyst 357

- triazole-substituted derivatives 190
 triazole-substituted iodoarenes 193
 1,2,3-triazolium 51
 1,2,4-triazolium 51
 triazolium-based chiral monodentate XB donors 43
 triazolium-based chiral XB donors 51
 tricyclic iodoarene 227
 triethylamine-HF 258
 triethylamine pentahydrofluoride (5HF·Et₃N) 281
 triethylamine trihydrofluoride 139
 triflic anhydride (Tf₂O) 342
 trifluoroacetic acid (TFA) 136, 164, 283, 339, 357
 trifluoroacetic anhydride 341
 trifluoroethanol 251
 trifluoroethanol (TFE) 345, 346
 2,2,2-trifluoroethanol (TFE) 211
 6-(trifluoromethyl)phenanthridines 160
 trifluoroperacetic acid 341
 1,1,1-trifluoroethanol (TFE) 342
 trimethylsilyl cyanide 39
 trimethylsilyl triflate 252
 trimethylsilyl trifluoroacetate 341
 trimethylsilyl trifluoromethanesulfonate (TMSOTf) 246
 trimethylsulfonium salt 123
 triphenylphosphine sulfide 14
 tripodal neutral XB donor 43
 trivalent iodanes 186
 TsOH 338
 turn-over numbers (TON) 318
 type I chiral iodoarenes 188
 type I C₁-symmetric catalysts 188
- U**
- unprecedented synergistic enantioselective hypiodite/imine catalysis 290
- unsaturated hydrocarbons 337
 unsubstituted (*R*)-2,2'-diiodonaphthalene [(*R*)-BINI] 201
 unsubstituted phenol ethers 166
 unsubstituted spirobiindane 197
 urea-hydrogen peroxide (UHP) 336
- V**
- vicinal dioxygenation 244–245
 vinyl acetate monomer (VAM) 387
 vinyl azides 94–96
 vinyl isocyanides 103–104
 2-vinylphenols 88
- W**
- Wagner–Meerwein reaction 267
 Wagner–Meerwein rearrangements 265, 266
 water-soluble iodylarene 313
 Willgerodt's reagent 215
 ω-iodocarbonyl compounds 127
 World Iodine Association 3
- X**
- XB **2a**-catalyzed 2-deoxyglycosylation 48
 XB-bonded hypervalent trimethylsilyl intermediates 39
 XB crystal engineering 14
 XB donors 14, 33, 34
 XB-induced alkylation method 49
 XB-mediated polymerizations 41
 XBphos-Rh complex 53
 XB template-induced macrocyclization 56
 x-ray structure analysis and computational investigations 197–201
- Z**
- ZnBr₂/*n*-Bu₄NI 93