

Index

a

- abnormal addition-elimination (AE_a)
 - mechanism 360, 361
- acetophenone-derived sulfonium salts 169
- acetylene dicarboxylates 171
- actinorhodin 473
- acylalkylation, of arynes 126
- 9-acyl-9*H*-fluorenes 124
- addition-elimination (AE_n) mechanism 360
- addition-fragmentation reactions 455
- AgF 183
- AgOTf-catalyzed reaction of
 - 2-alkynylbenzaldoximes with arynes 260, 261
- 3-alkoxy-2-naphthol 126
- alkynylbenzaldehyde 239
- alkynyllithium catalyzed aryne generation 326
- 1-allyl-2-alkynylbenzene derivatives 227
- amino benzotriazole 11
- aminocyanation, of arynes
 - with *N*-cyanoanilide 118
- aminosulfonylation, of arynes 114
- aminotriazole anion 389
- ammonium ylide 269
- aniline synthesis 111
- anthranilic acid derivatives 10
- aporphine alkaloids 464
- aquayamycin 467
- aristolactam alkaloids 465
- arizonins B1 459
- arnottin 460
- aroylacetonitriles 153
- 1-aryoyl-3,4-dihydroisoquinolines 299
- arylation reactions 17
- 9-aryldihydrophenanthrenes 15
- 2-aryl-2*H*-indazole 74
- aryl(mesityl)iodonium tosylate 320
- aryl ketone *O*-acetyloximes 215, 217
- 3-(arylsulfonyl)-2*H*-chromene-2-ols 168
- aryl vinyl sulfides 102
- aryne
 - amination reactions 114
 - natural product synthesis 21
 - possible reactivity modes of 13
 - arylation reactions 17
 - insertion reactions 17
 - MCC 18, 19
 - molecular rearrangements 18–19
 - pericyclic reactions 14–16
 - transition metal-catalyzed reactions 18
- [2+2] aryne cycloadditions 30–31
- [2+2+2] aryne cycloadditions 31–32
- [4+2] aryne cycloadditions 29–30
- aryne cycloaddition reactions 28
 - [2+2] aryne cycloadditions 30–31
 - [2+2+2] aryne cycloadditions 31–32
 - [4+2] aryne cycloadditions 29–30
- aryne dipolar cycloaddition 69, 70
- aryne generation methods 28
 - catalytic 323–326

- aryne generation methods (*contd.*)
 - ortho-deprotonative elimination
 - aryliodonio group 321
 - HOTf 320
 - LDAM 317, 319
 - PhCl-LiTMP system 317, 318
 - Uchiyama's conditions 319
 - ortho-difunctionalized precursors
 - Knochel's aryne precursors 323
 - photoinduced aryne generation methods 323
 - silyl-based or OTf-based
 - difunctionalized aryne precursors 322
 - Suzuki's *o*-iodoaryl triflate 322
 - strategy 316
- 2,3-aryne intermediate 12
- aryne-mediated synthesis, of functional polyarenes
 - acenes, synthesis of 32–41, 43
 - carbon nanostructures 58–60, 62
 - helicenes, synthesis of 54–58
 - perylene derivatives, synthesis of 43, 46, 47
 - π -extended starphenes, synthesis of 48–54
 - triptycenes, synthesis of 48
- aryne multifunctionalization
 - 1,2-benzdiyne 336–342
 - 1,4-benzdiyne 345–349
 - 1,3-benzdienes 342–345
 - 1,3,5-benztriyne 349–351
 - benzyne insertion, C–H
 - functionalization cascade 351–353
- aryne regioselectivity
 - electronic effect 330–335
 - intermolecular aryne reactions 327
 - small ring-fused arynes 335–336
 - steric effect 327–330
- arynes 1
 - characterization of 3–5
 - cycloadditions of 47
 - electrophilicity of 4
 - history of 1–3
 - Kobayashi's fluoride induced aryne generation 12–13
 - methods of 9
 - from anthranilic acids 10
 - deprotonation, of aryl halides 9
 - fragmentation, of amino benzotriazoles 10
 - HDDA 11
 - metal-halogen exchange/elimination 10
 - from *ortho*-borylaryl triflates 11–12
 - Pd(II)-catalyzed C–H activation strategy 12
 - ortho*-arynes
 - of heterocycles 6–7
 - with substitution 5–6
 - with oxaziridines 82
 - photochemistry of 4
 - transformations 128–129
 - aryne trifunctionalization 351, 353
 - aryne-triggered rearrangements 267
 - aryne-triggered Sommelet–Hauser rearrangement of tertiary benzylic amines 271
 - aryne-triggered [1,2]-Stevens rearrangement
 - benzylic thioethers 275
 - of benzylic thioethers 276
 - of tertiary amines 269
 - 1,2,3,4-tetrahydroisoquinolines 269, 270
 - aryne-triggered [2,3]-Stevens rearrangement
 - of allylic thioethers 277
 - of cyclic allylic amines 273
 - of propargylic thioethers 276, 277
 - of tertiary allylic amines 272
 - of tertiary propargylic amines 274
 - arynic triple bonds 36
 - arynophiles 111
 - atomic force microscopy (AFM) 27
 - Au-bearing pyrylium cation 93
 - Au-catalyzed cyclotrimerization of arynes 197–198

- azacyclic allene 399
 aza-HDDA reaction 430
 azanickelacycle 224
 aza-*ortho*-quinone methides 162
 2-azidoacrylates 98
 azomethine imines 83
 azomethineylides 160
- b**
- 1,2-benzdiyne
 aryne trifunctionalization through
 Grob fragmentation 341
 diamination reactions with TPBT
 reagent 339
 domino aryne nucleophilic-ene cascade
 339
 naphthyne from 1,2-benzdiyne-HDDA
 cascade 340
 process and equivalents 337
 σ -bond insertion of N-Si and S-Si
 bonds 342
 3-silylbenzyne 343
 TPBT with protected thiobenzamides
 338, 474
 1,3-benzdienes
 equivalents 473
 Ikawa-Akai's 343, 344
 Kitamura's hybrid 344
 Suzuki's strategy 343
 1,4-benzdienes 1, 7
 actinorhodin 345, 346
 bis(sulfonyloxy)diiodobenzene 345,
 346
 1,4-bis(trimethylsilyl)phenyl
 2,5-bis(triflate) 346, 347
 equivalents 471
 Ikawa-Akai's 348, 349
 Kitamura's hybrid 349
 nanographenes 347, 348
 vineomcinone B₂ methyl ester 350
 benzenediazonium 2-carboxylate 10, 33,
 60, 296, 446
 benzene thiol 133
 benzocyclobutene synthesis 122–123
 1,3-benzodithiol-2-imine 136
 benzo[*d*][1,2,3]thiadiazole 1,1-dioxide
 10
 2,3-benzofuranyne 362–363
 4,5-benzofuranyne 78
 benzo-fused carbocycles 1
 benzophenone *O*-perfluorobenzoyl
 oximes 215, 217
 benzothiadiazole dioxide 10, 11
 2,3-benzothiophyne 361, 363
 1,2,3-benzotriazin-4-(3*H*)-ones 222
 benzoxaphosphole derivatives 175
 benzoxazoles 230, 231
 1,3,5-benzotriyne
 Suzuki's synthesis of hexareadiene
 351, 353
 Suzuki's synthesis of TCBBs 352
 Suzuki's synthesis of tetraketone 350
 2-benzyl-3-hydroxy-1,4-naphthoquinone
 126
 benzyne 2
 cycloisomerization 409–410
 dimerization of 31
 benzyne-ene reaction 470
 Bergman cyclization 9
 Bettinger's synthesis, of undecacene 41
 biaryl synthesis 121
 bicyclohexene 8
 biphenylene-based starphenes 52, 53
 1,2-bis(trifluoromethylation) 249
 bisanthene 43, 46
 bis(pinacolato)diboron onto indolynes
 379
 bismuthosulfanylation, of arynes 138
 bis(trimethylsilyl)naphthalenes 43
 bis-tosylate 472
 boronic esters 192, 325, 329
 2-bromobenzofuran 362
 3-bromobenzofuran 2, 361, 363
 3-bromo-2-chloropyridine 366
 1-bromocyclohexene 398
 5-bromoindole 369
 7-bromoindole derivative 371
 2-bromophenylboronic ester 192
 3-bromo-4-(phenylsulfinyl)pyridine
 368

C

- carbazole-containing alkaloid
 - mahanimbine 414
- carbazolyne 384, 414, 469, 478
- carboamination, of *N*-benzoylanilide
 - 117
- carbodiimide-derived aza-*ortho*-quinone
 - methide 163
- carbodiimides 162, 163
- carbolithiation, of arynes 121, 122
- carbon-carbon triple bond 2, 5, 14, 171, 267, 280, 436
- carbon nanohorns 61, 62
- carbon nanotubes, by aryne
 - cycloadditions 60–61
- carbon nucleophiles
 - carbanions 452
 - enamines and enolates 453–454
- carboxylic acids 82, 129, 155, 156, 285
- catalytic aryne generation methods
 - alkynyllithium catalyzed aryne generation 326
 - Pd-catalyzed aryne generation 324
 - Pd-mediated aryne generation from benzoic acids 324–325
 - Pd-mediated aryne generation from methyl 2-bromobenzoates 325
 - Pd-mediated aryne generation from *o*-bromoaryl boronic esters 325
- C–B, C–I, or C–Cl bond formation, transformations 142
- cesium fluoride 126
- 4-CF₃-thiobenzonitrile 242
- C₆₀-graphene hybrids 63
- chelidonine 452, 461, 468, 469
- chiral α -bromoamide 99
- 1-chlorocyclohexene 388
- 4-chloroindole derivative 369
- 2-chloro-3,4-pyridyne 89
- C–H/N–H annulations
 - copper 224
 - Ni-catalyzed denitrogenative/annulation 222
 - palladium-catalyzed arynes 215–222
 - palladium-catalyzed carbocyclization 201–215
 - cine*-substitution via addition-ring-opening-elimination-ring-closure (ANRORC *cine*) 361
 - cine*-substitution via addition-substitution-elimination (ASE) 361
 - cine*-substitution via *trans*-halogenation (BCHD) 361
 - (\pm)-*Cis*-trikentrin A 384
 - ¹⁴C labelling 3
 - cloverphenes 49, 51, 186, 187
 - cobalt-, rhodium- and palladium-catalyzed carbonylative cycloaddition of benzynes 255–260
 - copper-catalyzed arynes
 - Ar–Sn bond Addition 244–246
 - B–B bond addition 244
 - 1,2-bis(trifluoromethylation) 249–251
 - C–Br bond addition 249
 - CuCF₃ 238
 - multi-component reactions
 - copper-catalyst 235, 236
 - [(IPr)CuCl]-catalyzed synthesis of isocoumarins 236–237
 - terminal alkynes and activated alkenes 236
 - P–H bond addition 253–255
 - sp C–H bond addition 247
 - three-component coupling
 - carboamination 230–233
 - copper(I) acetylide 232
 - o*-alkynyl aryl iodides 238
 - vinylaziridines 232
 - copper-mediated C–H/N–H annulation reaction
 - of benzamides 224, 225
 - of indolobenzamides and arynes 225
 - cossonidine 457
 - coumestans 220, 476
 - C–P bond formation, transformations 140–142, 143
 - crinine 470, 471
 - cryptaustoline 447, 448

- Curtius-type rearrangement 273, 274, 275
- curvularin 456, 457
- α -cyanoketones 124
- 2-cyanophenylstannane 245
- cyclic alkyne 4, 385
- cyclic amines 157, 294, 421
- cyclic 1,3-dipoles 70, 71, 90–92
- cyclic ketones 124, 126, 396
- cycloaddition
- Au(I)-catalyzed benzannulation of *o*-alkynyl(oxo)benzenes with arynes 198, 201
 - hetarynes 375–380
 - nickel-catalyzed arynes 193
 - palladium 184–193
 - of 4,5-pyrimidine 374
- [2+2] cycloaddition 16, 393
- aquayamycin 467
 - of (+)-CC-1065 470
 - chelidonine 469
 - cycloinmakiol 468
 - goupiolone A 468
 - nanaomycin D 466
 - ortho*-methylbenzaldehydes 468
 - polyketides 464
 - taxodione 466
 - tubingensin B 469
- [2+2+2] cycloaddition 28
- [4+2] cycloadditions
- aporphine alkaloids 464
 - aristolactam alkaloids 465
 - arizonins B1 459
 - arnottin 460
 - ent*-gilvocarcin M 458
 - ent*-Sch 47555 471
 - granaticin A 460
 - intramolecular Benzyne-Diene 463
 - isocryptolepine 476
 - isokidamycin 461
 - ningalins D and G 462
 - nomitidine 461
 - pseudopterosin aglycon 463
 - rifsaliniketal 459
 - rishirilide B 460
 - spiroxin C 459
 - trikentrins 462
 - vineomycinone B₂ methyl ester 472
- cycloaddition reactions 5
- [2+2] cycloaddition 393–394
- cycloalkynes
- Diels–Alder Reaction 393, 394
 - 1,3-dipoles 394
- [2+2] cycloaddition reactions 15
- [3+2] cycloaddition reactions 16
- 1,2-cycloalkadienes reactions
- [2+2] cycloaddition reaction 401
 - Diels–Alder reaction 400–401
 - 1,3-dipolar cycloaddition 401–402
- cycloalkynes
- alkenylation reactions 395
 - allenic intermediate 386–387
 - ¹⁴C-labelled 1-chlorocyclohexene with phenyllithium 386
- cycloaddition reactions
- [2+2] cycloaddition 393–394
 - Diels–Alder Reaction 393, 394
 - 1,3-dipoles 394
- cycloheptyne 387
- cyclohexyne 387
- cyclopentyne 387
- dodecahydrotriphenylene from 1,2-dibromocyclohexene 385
- fluoride induced cyclohexyne generation
- cyclohexenyne 392–393
 - 3,4-oxacyclohexyne 391
 - 2,3-piperidyne 392
 - 3,4-piperidyne 392
- insertion reactions 395–396
- phenyllithium with
- 1-chlorocyclohexene 385–386
- reactivity and isolability of 384
- traditional methods of
- aminotriazoles fragmentation 389
 - base induced 1,2 elimination 388–389
 - 1,2-bishydrazones oxidation 390
 - diazirine fragmentation 390

- cycloalkynes (*contd.*)
- metal-halogen exchange/elimination 389
 - vinylidenecarbenes rearrangement 390, 391
 - trapping of 386–387
- cycloheptyne 386, 387, 388, 389, 390
- cyclohexyne 384, 385, 386, 387, 388, 389, 390, 391, 393, 394, 395, 396, 397, 400
- cycloinnumakiol 467, 468
- cyclopentadienone 20, 29, 42, 43, 58, 347, 426
- cyclopentyne 385, 386, 387, 389, 390, 391
- cyclotrimerization
- gold-catalyzed self-trimerization of arynes 197, 200
 - nickel-catalyzed arynes 193
 - palladium 184–193
- d**
- dehydrogenation 33, 34, 43, 57, 89, 99, 454
- dehydrohalogenation, of aryl halides 27, 316, 318, 368
- 3,4-Dehydro-1,5-naphthyridine 362, 373, 374
- 2,3-dehydropyridine-*N*-oxides 362
- 1,2-diallylated benzenes 226
- diaroylmethanes 153
- diaryl sulfoxides or sulfilimines 304
- diazo compounds 72, 75
- dibenzophosphole derivative, synthesis of 122
- dibenzopyrrocoline alkaloids 447
- dibenzosultams 222
- 1,2-diborylarene 243
- 1,2-dibromobenzene 141
- 1,4-dibromobenzene 36
- 1,2-dibromocyclohexene 385
- dibromoindole 369–370
- dibromoisobenzofuran 35
- 2,3-dibromonaphthalene 34, 35
- 1,3-dicarbonyl compounds 124
- 1,2-didehydrobenzene diradicals 409
- 2,3-didehydronaphthalene 34
- Diels–Alder (D–A) reactions 3, 7, 27
- of tropones 15
- diepoxypentacene 36
- difluorobenzene 471
- difunctionalization, of arynes 118, 119, 132, 144, 231, 278–303
- 1,2-difunctionalization of arynes
- formal insertion of arynes into carbon-carbon bonds
 - cyclic ketone 278
 - 1,3-diketones 281
 - β -ketoesters 279, 280
 - α -lithiated malonate/an α -lithiated nitrile 279
 - malonates and 1,3-diketones 279–280
 - N*-tosylacetimidates/*N*-tosylacetimid-amides 283
 - α -substituted ketones 281–282
- formal insertion of arynes into carbon-heteroatom bonds
- acyl-oxygen and acyl-halogen σ-bonds 285
 - C–P and C–S bonds 286
 - ethoxyacetylene 287
 - imidazolidines 287
 - imides, ureas, and cyanamides 284
 - secondary amides 283
 - tertiary amides 284, 285
- formal insertion of arynes into heteroatom-heteroatom bonds 288
- vicinal formation 289
- 1,8-difurylnaphthalene 46
- dihalide pyridine precursor 366
- 2,3-dihydro-1*H*-indazole 298
- dihydroisoquinolinium *N*-oxide 86, 87
- 9,10-dihydrophenanthrenes 187, 190
- diiodobenzenes, pyrolysis of 3
- dimethyl acetylenedicarboxylate (DMAD) 32, 55, 185, 187, 430
- 1,2-dimethylenecyclobutane 33
- dimethyl maleate 39, 161

- dinaphthocoronene tetracarboxdiimide 204
- 2-diphenyliodonium carboxylate 28
- 1,3-diphenylphenanthrofurane 41
- 1,2-diphosphinobenzene derivatives 141
- 1,3-dipolar cycloaddition 16
- 1,7-dipolar cycloaddition 72
- 1,3-dipolar cycloaddition reactions 29, 70, 71
- cycloaddition, of arynes 95–97
- cycloaddition, with dipoles 92–95
- [3+2] dipolar cycloaddition reactions, cyclic 1,3-dipoles
- arynes, with Münchnones 92
- arynes, with sydnones 90–92
- [3+2] dipolar cycloaddition reactions, linear 1,3-dipoles
- arynes with azides 75–79
- arynes, with azomethine imines and ylides 83, 84
- arynes, with nitrile imines 80
- arynes, with nitrile oxides 79–80
- arynes, with nitrones 80–83
- arynes, with pyridinium *N*-imides 87–89
- arynes, with pyridinium *N*-oxides 85–87
- arynes, with pyridinium Ylides 89–90
- with diazo compounds 72–75
- formal cycloaddition reactions 97
- hydrazone-derived N–N–C systems 99–103
- N–C–C systems 97, 99, 100
- 1,3-dipolar cycloadditions (1,3-DC) 70
- dipolarophiles 16, 69, 80, 83, 90, 394
- dipolar variant 93
- 1,3-dipoles 70, 394
- 3,6-di-2-pyridyl-1,2,4,5-tetrazine 35
- diselenide 427–428
- distal vinylic position 102
- 1,2-disubstituted arenes 150
- 2,4-disubstituted benzothiazole 338
- diverse transformations 123
- diynamide 414
- DMSO-derived textit-*ortho* species 171
- 1-dodecanethiol 133
- domino aryne generation 19
- domino HDDA 426
- domino Heck spirocyclization 211, 213
- double helicene, Synthesis of 55
- dynemicin A 455, 456
- e**
- 6 π -electrocyclization 478
- electron-deficient alkynes 32, 153, 154, 185, 424
- electronic effect
- 3-borylbenzynes 332
- 3,4-pyridyne 333, 334
- regio-complementary [3+2] cycloaddition 332, 333
- reversing regioselectivity on 4,5-indolyne 333, 334
- silyl groups 331
- substituted benzynes and hetarynes 330, 331
- electron-withdrawing groups 75, 77, 159, 207, 229, 301, 305
- elimination-addition (EA) mechanism 360
- elusive bimolecular HDDA reaction 433–434
- enal trapping 427
- enamines 97, 98, 446, 452, 453–454
- ent*-clavilactone B 453
- epoxynaphthalene 14, 27, 35
- 2-ethoxybenzofuran 1, 362
- eupolauramine 21, 380, 382, 383
- f**
- few-layer graphene (FLG) 62
- final cyclization 46
- five-membered hetarynes 7, 359, 361
- five-membered heterocycles 70, 80, 361, 365
- flash vacuum thermolysis (FVT) experiment 363
- flemichapparin C 220, 476, 477
- fluoride induced cyclohexyne generation

- cyclohexenynone 392–393
 - 3,4-oxacyclohexyne 391
 - 2,3-piperidyne 392
 - 3,4-piperidyne 392
 - fluoride induced elimination 10
 - azacyclic allene 399
 - cycloalkatriene generation 400
 - oxacyclic allene 399–400
 - α -fluoro- β -amino acid derivatives 153
 - 3-fluoro-2-iodophenyl triflate 133
 - formal insertion of arynes
 - carbon–carbon bonds
 - cyclic ketone 278
 - β -ketoesters 279, 280
 - malonates and 1,3-diketones 279, 280
 - α -substituted ketones 281, 282
 - carbon–heteroatom bonds
 - acyl–oxygen and acyl–halogen σ -bonds 285
 - C–P and C–S bonds 286
 - ethoxyacetylene 287
 - imidazolidines 287
 - imides, ureas, and cyanamides 284
 - secondary amides 283
 - tertiary amides 284, 285
 - heteroatom–heteroatom bonds
 - C–P and C–S bonds 286
 - N–O bonds 289, 290
 - organophosphorus acids and sulfinamides 288, 289
 - phosphoryl amides 288
 - [1,3]-rearrangement 289
 - formamide 427–428
 - fragmentation, of amino benzotriazoles 10
 - fredericamycin A 456
 - free radical explanation 2
 - fullerobenzene precursor 60
- g**
- Garg–Houk’s study 328–329
 - gold/copper-catalyzed sp C–H bond Addition 247
 - goupiolone A 467–468
 - granaticin A 460
 - Gribble’s bisaryne synthesis, of tetracenes 37
 - Gribble’s synthesis, of tetracenes 35
 - Grob fragmentation 12, 340–341
 - guanacastepenes O and N 396, 397
- h**
- halobenzene 2, 9, 316, 319, 324, 336
 - halogen–metal exchange reactions 446
 - 3-halopyridine 365, 367
 - Hamura’s synthesis, of substituted pentacene 36, 39, 53
 - Hart’s bisaryne synthesis, of dodecamethyltetracene 37
 - Hart’s synthesis, of epoxyacenes 38
 - Heck-type coupling of benzynes 228
 - helical corannulene trimers 57
 - helicene synthesis 91
 - (\pm)-herbindole A 384
 - herbindole B 413–414
 - hetarynes 114
 - abnormal addition–elimination (AE_a) mechanism 360, 361
 - addition–elimination (AE_n) mechanism 360
 - cycloaddition reaction 375
 - elimination–addition (EA) mechanism 360
 - five-membered 359, 361
 - indolyne
 - herbindole 384
 - lysergic acid synthesis 383
 - trikentrin 384
 - insertion reaction 379–380
 - nucleophilic addition reactions 377–379
 - pyridine
 - ellipticine synthesis 382
 - eupolauramine 382, 383
 - (S)-Macrostomine 382
 - perlolidine synthesis 381
 - six membered 359, 361

- heterocycles 1, 6–7, 21, 30, 70, 80,
97, 150, 157, 159, 163–165, 237,
257, 273, 301, 317–318, 361, 365,
369
- heterocyclic helicenes 57
- hetero-Diels–Alder reaction 93
- hexabenzotriphenylene, synthesis of
54–55
- hexacene 33–34, 39, 426
- hexadehydro Diels–Alder (HDDA)
reaction 1, 11, 114, 149
- Ag- and B-promoted carbene chemistry
412–413
- aryne formation 315, 428
- aza-HDDA variant 431
- benzyne cycloisomerization 409, 410
- classical vs. HDDA benzyne chemistries
431
- Cu(I)-Catalyzed hydro- and
halocupration 428
- de novo arene ring construction
413–414
- diselenide 427
- diynophile 434
- domino 426
- elusive bimolecular HDDA reaction
433
- enal 427
- examples of 411–412
- formamide 427
- half-life measurements 437–438
- intramolecular 424
- Lee group 416, 417
- naphthynes via double 424, 425
- natural products
colchicine and quinine 420
phenol 419
- new mechanistic insights
dearomatizing ene reaction 424
diaziridine 424
dihydrogen transfer reactions
422–423
silyl ether 424
thioamides 424
three component reactions 421–422
- NHC-borane trapping 427
- nucleophilic trapping agent 432
- 4 π - and 2 π -components 407, 408
- perylene 426
- [4 π +2 π] cycloaddition reactions,
aromatic dienes 416, 417
- pristine reaction conditions 435
- reaction conditions
temperature, pressure, and alkyne
stability 436–437
tolerance for water and oxygen
435–436
- substrate concentration 437
- substrate design 434
- trapping agents 433
- triyne to benzyne 415
- unanticipated transformation 411
- hexaphenyltetrabenzopentacene 41
- highest occupied molecular orbital
(HOMO) 4–5, 29, 41, 183, 415
- 1*H*-indazoles 72–75
- 3*H*-indazoles 72–74
- Hückel theory 4, 8
- hydrazonyl chlorides 80, 99–100
- 4-hydroxycoumarins 220
- i**
- ibutamoren mesylate 339, 474
- Ikawa-Akai's
1,3-benzdiyne strategy 344
1,4-benzdiyne strategy 348, 349
- 3-imidopyridinium 94
- 3-imidopyridinium species 72, 94
- imine oxides 80
- iminoesters 260
- 6,7-indoline 57
- indolinyne generation 375
- 2,3-indolyne 361
- 4,5-indolyne 78
- 2,3-indolyne generation 363
- 4,5-indolyne generation
5-bromoindole 369
4-chloroindole derivative 369
dibromoindole 369–370
silyltriflate precursor 370

- 5,6-indolyne generation 370
- 6,7-indolyne generation
- 7-bromoindole derivative 371–372
 - dichloroindole precursor 371
 - proton-lithium exchange 371
- insertion reactions 17
- of arynes 118, 140, 153, 280
- insertion reactions, of aryne intermediates
- amination and related transformations
 - formation of C–N and C–C bonds 116–118
 - formation of C–N and C–H bonds 111–115
 - formation of C–N and C–Mg bonds 115–116
 - formation of C–N and C–S, C–P, C–Cl, or C–Si bonds 118–121 - bond formation, with nucleophilic carbons
 - acylalkylations and related transformations 124–128
 - benzocyclobutene synthesis, [2+2] cycloaddition 122–123
 - transformations, carbometalation 121–122
 - transformations, C–C and C–H bond formations 128–129 - etherification, and transformations 129, 132, 133
 - in situ* generated nitrile oxides 80
 - intramolecular arylation 114
 - intramolecular benzyne–diene [4+2] cycloaddition 463
 - intramolecular *N*-arylation 117
 - iodine-magnesium exchange 114
 - 2-(2-iodophenoxy)-1-substituted ethanones 204
 - 1-iodo-2-(2-(phenylethynyl)benzyloxy) benzenes 204
 - isobenzofuran 35, 39–40, 52, 290, 386
 - isochromen-6-ones 204
 - α -isocyanoacetamides 152
 - β -(2-isocyanophenoxy)acrylates 290
 - isokidamycin 460–461
 - isolable cyclic 1,3-dipole 90
 - isopropylmagnesium chloride (iPr-MgCl) 116, 322
 - isoquinolinium *N*-oxides 86–87
 - 3,4-Isoquinolyne 373
 - isotopomers, of phthalic anhydride 3
 - isoxazolone 392
- j**
- justicidin B 192, 475
- k**
- Kelly's synthesis, of molecular ratchet 48
- ketene dithioacetals 102–103
- ketene silyl acetals (KSAs) 123, 321, 340, 343, 350–351, 467, 470, 472
- ketene silyl acetyls (KSAs) 340
- β -ketophosphonic acid diester 127
- ketoxime-derived nitrones 83
- Kitamura's hybrid 1,3-benzdiyne equivalent 344
- Kitamura's hybrid 1,4-benzdiyne equivalent 349
- Kitamura's synthesis, of substituted tetracenes 45
- Kita's synthesis of fredericamycin A 456
- Knochel's aryne precursors 323
- Kobayashi method 267, 269
- Kobayashi's aryne 183, 391
- Kobayashi's fluoride induced aryne generation 12–13
- Kobayashi's method 13, 29, 36, 39, 46, 149, 315, 321, 331, 340, 347, 354
- Kobayashi-typed benzdiyne precursor 95
- koenidine 478
- l**
- Larock's group 201, 215
- laserflash photolysis (LFP) 5
- LiBr elimination 363
- liphalgal 451
- 2-lithio-3-bromo-1-phenylsulfonylindole 363

- lithium di-alkyl(2,2,6,6-tetramethylpiperidino)zincate ($R_2Zn(TMP)Li$) 319
- lithium diisopropylamide (LDA) 317, 319, 320, 336, 372, 459, 463, 470
- lithium 2,2,6,6-tetramethylpiperidide (LiTMP) 317–318, 449, 455, 467
- lithium tetramethylpiperidide (LTMP) 38
- lowest unoccupied molecular orbital (LUMO) 4–6, 13, 29, 111, 183, 434, 445
- low-valent titanium 41
- lysergic acid synthesis 383
- m**
- (*S*)-macrostomine 382
- makaluvamines 369, 380, 384, 448
- m*-benzyne 8
- 2-mercaptobenzothiophenes 103
- mesogenic tetrabenzopentaphenes 50
- mesoionic rings 70
- metal bound benzyne 4–5
- metal-halogen exchange/elimination 10, 326, 389
- metallacycloprenes 5
- metal-metal (or) metal-carbon bond
arynes
copper-catalyzed Ar–Sn bond Addition 244–246
copper-catalyzed B–B bond addition 244
copper-catalyzed C–Br bond addition 249
copper-catalyzed P–H bond addition 253–255
copper-mediated 1,2-bis(trifluoromethylation) 249–251
gold/copper-catalyzed sp C–H bond addition 247–248
palladium-catalyzed C–Sn bond addition 240–241
palladium-catalyzed Sn–Sn/Si–Si bond Addition 241
platinum-catalyzed boron–boron bond addition 243–244
sp C–H bond Addition 247
- meta*-methoxyaniline derivatives 113
- 3-methoxybenzyne 113
- 4-methoxybenzyne 95
- 4-methylbenzenesulfonate 372
- methyl 2-bromobenzoates 191, 324, 325
- (trimethylsilyl)methylmagnesium chloride 119
- Michael acceptor 95, 97
- Michaelis–Arbuzov-type reactions 141
- microporous polymers 48
- molecular gyroscope 48
- molecular rearrangements 13–14, 18, 21, 267–310, 393, 400
- molecular rearrangements triggered
1,2-difunctionalization of arynes 278–303
four-component reactions with three aryne molecules 308–309
monofunctionalization of arynes
nitrogen nucleophiles 268–275
sulfur nucleophiles 275–278
three-component reactions with two aryne molecules
of 4-hydroxycoumarins 306, 307
nitriles 306
oximes 306, 308
thioureas 306, 307
1,2,3-trifunctionalization of arynes 303–305
- 3-morpholinobenzyne 114
- Müllen's synthesis, of pentacene 33
- multicomponent couplings (MCCs) 14, 18
reactions of arynes 183, 184
- multicomponent reactions 149
carbon nucleophile-based
multicomponent reactions
active methylenecompounds 153
isocyanide 150–152
classification of 150
halogen nucleophile-based 177–179
nitrogen nucleophile-based

- multicomponent reactions (*contd.*)
- amine 153, 155–159
 - diazene 164–165
 - imine 159–163
 - N*-heteroarene 163–164
 - nitrite 165
 - oxygen nucleophile-based
 - cyclic ether 172–173
 - dimethylformamide 165–169
 - sulfoxide 169–172
 - trifluoromethoxide 173–174
 - phosphorus nucleophile-based 174–175
 - sulfur nucleophile-based 176–177
 - multisubstituted naphthalenes 153
 - Münchnone 70–71, 92
- n**
- N*-alkoxyamides 114
 - N*-alkoxybenzulfonamides 222
 - N*-alkoxy oxyindoles 99
 - N*-aminotriazolo-pyridine 366, 368
 - nanaomycin D 466
 - nanographene 50–51, 57, 345, 347, 348, 353
 - 1,2-naphthalene 91
 - 2,6-naphthodiyne synthon 42
 - 2,3-naphthyne 34
 - naphthynes 6, 34, 36, 40, 49, 340, 424–426, 428–429
 - N*-aryl-2-acylpyrrolidines 273
 - N*-arylation
 - of amines 17
 - with arynes 126
 - of *N*-H sulfoximine 114
 - reaction 113
 - natural bond orbital (NBO) 76, 78
 - natural product synthesis
 - addition–fragmentation reaction 454–457
 - 1,3-benzdiyne equivalents 473
 - 1,4-benzdiyne equivalents 471
 - benzyne–ene reaction 470–471
 - benzyne generation via hexadehydro-Diels–Alder reaction 477–479
 - benzyne precursors 447
 - [2+2] cycloadditions 446, 464–470
 - [4+2] cycloadditions 446, 457–464
 - ene reactions 446
 - nucleophilic additions to benzyne
 - carbon 452–454
 - nitrogen 447–450
 - oxygen nucleophiles 450–452
 - transition-metal catalyzed reactions 474–477
 - N*-benzoyloxymorpholine 116
 - N*-benzoylquinolinium imides 93
 - N*-benzyl-*N*-tosylenamide 123
 - N*-*boc*-2-methyleneglycine derivatives 97
 - 1,*n*-dipolar cycloaddition 69
 - 1,*n*-dipoles 69, 70
 - Neckers's synthesis, of hexacene 34
 - N₂ extrusion 35, 39, 43
 - NHC–borane trapping 427–428
 - Ni-catalyzed denitrogenative/annulation 222–223
 - nickel-catalyzed arynes
 - cycloaddition
 - activated alkenes and alkynes 197, 200
 - with alkynes/eneynes 197
 - of enynes and arynes 196, 199
 - 3,4-pyridyne with 1,3-diynes 195, 198
 - with unactivated alkenes 196, 199
 - cyclotrimerization
 - with allenes 194, 196
 - with diynes 195
 - three-component coupling 230
 - ningalins D and G 462
 - nitrile imines 16, 70–71, 80, 99, 102, 394
 - nitrile oxides 16, 70, 77–80, 394, 401
 - nitrogen nucleophiles
 - acronycine 450
 - aryne-triggered Sommelet–Hauser rearrangement of tertiary benzylic amines 269, 271
 - aryne-triggered [2,3]-Stevens rearrangement 273

- benzyne-induced [1,4]-rearrangement 270, 271
 cryptaustoline 448
 Curtius-type rearrangement 273, 275
 dibenzopyrrocoline alkaloids 447
 dictyodendrin A 449
 textit-benzyl glycinate 270
 of hinckdentine A 450
 indolactam V 450
 isobatzelline C 448
 makaluvamine A 448
 quinazolinone alkaloids 450
 (aminomethyl)silane 268
 three-component reaction of pyridines, arynes and isatins 275
 triethylamine 268
 nitrones 16, 70–71, 78, 80–83, 85, 87, 308, 331, 376, 394, 401–402
N-methoxybenzamides 217, 219
N-methylcrinasiadine 476
N-methyltetrahydroquinoline 157
N-monosubstituted hydrazones 101
N-monosubstituted hydrazonyl chlorides 99
N,N-dialkylanilines 157
N,N-dimethylaniline 114
N,N-dimethylhydrazone 118
N,N-dimethylhydrazonyl chlorides 100
 nomitidine 461
 non-anionic nucleophiles 445
 1,3,8-nonatriyne 409
 non-zwitterionic amphiphiles 70
 N—O single bond 85
N-substituted-*N*-(2-halophenyl) formamides 209
N-substituted phenanthridinones 209
N-tosylhydrazones 75, 101
N-tosylisoquinolinium imides 89
N-(trifluoroacetyl)anilides 118
 Nuckolls's synthesis, of substituted pentacenes 45
 nucleophilic addition reactions 332, 370, 375, 378–379, 402
 hetarynes 377
 nucleophilic C–C bond formation 122
 nucleophilic organophosphorus compounds 140
 nucleophilic organosulfur compounds 133
 nucleophilic substitution reaction 2, 360
N-vinyl- α,β -unsaturated nitrones 81
- O**
- O* allyl migration 172
o-aminoarylsilanes 119
O-arylation, with arynes 82
o-benzoxazolyhydroxylamines 230
o-benzyne 4
o-dihaloaryls 27
o-haloaryl sulfonates 321
o-iodoaryl sulfonates 116
o-iodoaryl triflates 114, 123, 321
 one-pot transformation 35, 39
 one-pot tricyclic phenanthridinones 217
 organolithium reagents 179–180
 organometallic reagents 10, 225, 227
 organonitrogen compounds 114, 116
 organophosphorus compounds 140–142
ortho-formyl diaryl ethers 169
ortho-methylbenzaldehydes 468
ortho-olefinated biphenyls 190
ortho-quinoid species 170
ortho-quinone methide 168, 169
ortho-silyl aryltriflates 183
ortho-(trifluoromethoxy)aryl anion 173
ortho-(trimethylsilyl)phenyl triflate 183
o-silylaryltriflates 50, 111, 119, 133
o-silylaryl triflate-type 3-sulfanylaryne precursors 138
o-silylphenyl triflate 321
o-transpositioned ketones 93
o-(trimethylsilyl)phenyl triflate 28
 oxacyclic allene 399–400
 3,4-oxacyclohexyne 387, 391
 oxidative photocyclization reactions 55
 3-oxidopyridinium dipole 72
 oxonium Claisen rearrangement 172, 304, 351

oxygen nucleophiles 165–174, 284, 446, 450–452

oxysulfanylations, of aryne intermediates 132, 135

P

paddle-wheel nanostructures 59–60

palladacycloheptadiene 190

palladium-catalyzed arynes

ArS–CN addition 241–243

co-cyclization 185

C–Sn bond addition 240–241

trimerization of (2-bromophenyl)

boronic esters 192

in C–X annulations

aryl ketone *O*-acetyloximes 215, 217

benzophenone *O*-perfluorobenzoyl

oximes 215

dibenzosultams 222

N-acylcarbazoles 215, 216

N-methoxybenzamides 217, 219

N-methyl benzylamines 221

one-pot tricyclic phenanthridinones

217, 219

ortho-halobenzamides 216

phenanthridinones 221

phthalimides 222, 223

quinolinones 218, 220

cycloaddition

with alkynes 186

allylic chlorides or alkynes 188

benzodiyne 188

benzoic acids 191, 192

cloverphene 186, 187

conjugated dienes 192

indole-based conjugated trimers

192

methyl 2-bromobenzoates 191

substituted diynes 188, 189

cyclocarbonylation

1*H*-inden-1-ones 259

cyclotrimerization 185

allenes 190

bicyclic alkene 187, 188

carbon-carbon π -components 185

cloverphene 187

coupling of alkenes 190

substituted indole based arynes 192

Pd(0) oxidation state 184

Sn–Sn/Si–Si bond addition 241

three-component coupling

with allylic epoxides and terminal

alkynes 228

allylic halides and alkynyl stannanes

226

arynes, isocyanides and

cyanofornates 230, 231

arynes, terminal alkynes, and vinyl

cyclopropanedicarboxylate 229,

230

bis-allylation 226

Heck-type coupling 228, 229

Sonogashira type coupling 227

Stille and Suzuki coupling reactions

227

three-component reaction

carbon monoxide and 2-iodoanilines

259

palladium-catalyzed carbocyclization

aromatic halides with arynes 202, 203

arynes with allyl-substituted

iodocyclohexenones and

iodofuranones 209

arynes with propargylic carbonates

207

biscarbocyclization reactions 206

carbopalladation of arynes with

iodo-aryl-alkenes 213, 214

chemoselective [3+2] spiroannulation

of 2-halobiaryls with arynes 216

(diarylmethylene)cyclopropa[*b*]-

naphthalenes with arynes 206

dinaphthocoronene tetracarboxdiimide

204

domino Heck spirocyclization 211,

212

2-halobiaryls with arynes 201, 202

indolo-[1,2-*f*]phenanthridines 203

2-iodobenzyl-3-phenylpropiolates 204

- 2-(2-iodophenoxy)-1-substituted ethanones 204
- N*-(2-halophenyl)formamides with arynes 210
- N*-(2-phenylallyl)sulphonamides with arynes 210, 212
- o*-halobenzaldehydes with arynes 203
- ortho*-halostyrenes with arynes 210, 211
- polycyclic dibenzocoronene
 bis(dicarboximide) 204
- substituted *o*-halostyrenes with arynes 208
- three-component coupling of aromatic halides with alkynes and arynes 202, 204
- three component coupling of aromatic iodides with
 bicyclic/heterobicyclic alkenes and arynes 203, 205
- palladium-catalyzed [2+2+2]
 cocyclotrimerization 32, 49
- palladium-catalyzed cocyclotrimerization, of arynes 49
- palladium-catalyzed cyclotrimerization, of indolynes 57
- papaverine 238, 453
- Pascal's synthesis, of twisted substituted pentacene 42
- p*-benzyne intermediates 8
- Pd-catalyzed aryne generation 324, 325
- Pd-mediated aryne generation
 from benzoic acids 325
 from methyl 2-bromobenzoates 325
 from *o*-bromoaryl boronic esters 325
- Peña's synthesis, of decacene 40
- pentahelicene 56
- 1,3-pentanedione 126
- Pérez-Peña synthesis, of benzo-fused substituted acenes 44
- Pérez's synthesis 58
- pericyclic reactions 13–15, 315, 339, 446
- perlolidine 380–381
- perylene 43, 45–47, 426
- perylenebisimides (PBIs) 46, 47
- π -extended starphenes, synthesis of 49–52, 54
- 3,4-phenanthryne 91
- phenyl(2-(trimethylsilyl) phenyl) iodonium triflate 10–11
- phenylpropionic acid 408
- phenylsulfanylation, of arynes 135
- 1-phenylsulfonyl-2,3-indolyne 363
- 3-(phenylthio)benzyne 114
- (2-aminoaryl)phosphine oxides 288
- α -phosphinylacetonitrile 127
- photoinduced aryne generation methods 323
- photoinitiated benzenediazonium carboxylates decomposition 3
- platinum-catalyzed boron-boron bond addition 243–244
- P–Li bonds 140
- polycyclic aromatic compounds 19–20, 54, 185, 188, 201, 345
- polycyclic aromatic hydrocarbons (PAHs) 19–20, 29–31, 48–55, 57–58, 204, 345–346, 353–354, 393–394
- polycyclic aryne precursors 187
- polycyclic dibenzocoronene
 bis(dicarboximide) 204
- porous triptycene-based molecules 48
- possible reactivity modes of
 arylation reactions 17
 insertion reactions 17
 MCC 18, 19
 molecular rearrangements 18–19
 pericyclic reactions 14–16
 transition metal-catalyzed reactions 18
- prefluoroalkoxylation–bromination reactions 174
- proton-lithium exchange 371
- pseudopterosin aglycon 463
- pyrazolo[5,1-*a*]isoquinolines 239–240
- 2,3-pyridine dicarboxylic anhydride 7
- pyridinium *N*-oxides 71, 85–87, 96
- 1,2-pyridyne 362
- 2,3-pyridyne 377
 dihalide pyridine precursor 366

- 2,3-pyridyne (*contd.*)
 3-halopyridine 365–366
N-aminotriazolo-pyridine 366
 3-(trimethylsilyl)pyridin-2-yl
 trifluoromethanesulfonate 367
 pyridyne-*N*-oxides generation
 374–375
 3,4-pyridynes 7, 378, 380
 3-bromo-4-(phenylsulfinyl)pyridine
 368
 3-halopyridine 367–368
N-aminotriazolo-pyridine 368
 thermolysis of diazonium carboxylates
 367
 4-trialkylsilyl-3-pyridyl triflate 368,
 369
 4,5-pyrimidyne 77, 373
 α -pyrones 462
 pyrroloindole 474
 3,4-pyrrolynes 364
- q**
 quinolynes generation
 5,6- and 7,8-dehydroquinolines 372
 3,4-isoquinolyne 373
 7,8-quinolyne 372, 373
 3,4-quinolyne from halo derivatives
 372
- r**
 regioselective amination, of pyridynes
 114
 regioselectivity
 in aryne reactions 3
 rationales 78
 of unsymmetrical benzyne 77
 resonance stabilization energies (RSE)
 415, 434
 retro-D–A reaction 33, 35, 37–39
 retrojusticidin B 192, 475
 retro-6 π electrocyclization 94
 Rickborn's synthesis
 of pentacene 37
 of tetracene 35
 rifsaliniketal 458–459
 rishirilide B 459–460
 Ritter-type reactions 416
- S**
 scanning tunnelling microscopy (STM)
 40, 50, 53
 Schlüter's synthesis, of epoxyacenes 38
 selaginpulvilin C 414, 478
 selaginpulvin C 413–414
 1,3-sigmatropic-like rearrangement 86
 1,3-sigmatropic rearrangement 83
 silver-catalyzed [3+2] cycloaddition of
 arynes 74, 260–261
 silylamination, of arynes 119, 121, 141
 silylaryl triflates 70, 114, 119, 138, 267,
 269–270, 272–273, 275–276,
 279–281, 283, 285–290, 292,
 294–295, 298–299, 301, 303–306,
 309, 321, 345, 449, 451, 453–454,
 456–457, 460–461, 464, 468,
 474–477
 3-silylbenzyne 77
 silyl ether 351, 411, 423–424, 428, 463
 silylmethyl Grignard reagent 114, 121,
 133, 322
 silylphosphination, of arynes 141, 143
 silyl-protected carboxylic acids 285
 silyltriflate precursor 370, 372, 378, 391,
 393
 singlet-triplet splitting 3, 8
 six membered hetarynes 7, 359, 361
 small ring-fused arynes 335–336
 Sommelet–Hauser rearrangement
 269–271
 Sonogashira type coupling 227–228
 sp²-hybridization 70
 spiropalladacycle 212
 spiroxin C 459
S-silyl sulfides 136
 starphenes 48–54
 steric effect
 3-alkyl groups on arynes 327, 328
 boronic esters 329
 Garg–Houk's study 329
 silyl 328

- trimethylsilyl (TMS) group 328
 [1,2]-Stevens rearrangement 268
 strained cyclic allenes
 1,2-cycloalkadienes generation
 base induced 1,6-elimination 397
 cyclopropylidenes rearrangement 398
 fluoride induced elimination 398–400
 via pyrolysis of ketene 398
 1,2-cycloalkadienes reactions 400
 styrenes, reaction of 15
 α -substituted α -diazophosphonate 74
 sulfanylation
 hydrosulfanylation, of arynes 133, 135
 transformations, C–S and C–C bond formations 135
 transformations, C–S and C–X bond formations 136, 138, 140
 sulfanylation reactions, of arynes 133
 sulfanyl magnesiations, of arynes 136
 sulfur 102–103, 170, 176–177, 275–278, 299, 302–304, 306, 363, 426, 434
 sulfur nucleophiles
 aryne-triggered [1,2]-Stevens rearrangement 275
 aryne-triggered [1,2]-Stevens rearrangement of benzylic thioethers 276
 aryne-trigger [2,3]-Stevens rearrangement of allylic thioethers 276, 277
 aryne-trigger [2,3]-Stevens rearrangement of propargylic thioethers 276, 277
 benzyne-triggered [2,3]-Stevens rearrangement of allylic thioethers 276, 277
 superior electrophile 183
 Suzuki–Miyaura C–C coupling 46
 Suzuki–Miyaura cross-coupling reactions 243, 379
 Suzuki's 1,3-benzdiyne strategy 343
 Suzuki's synthesis of hexarealene 351, 353
 Suzuki's synthesis of TCBBs 352
 Suzuki's synthesis of tetraketone 350
 sydnone 70–71, 78, 90–92
 symmetrical tetraynes 412, 424, 426, 432
- t**
- taiwanins 188–189, 475
 tandem aryne cycloadditions 47
 tandem [4+2]/[2+2] cycloaddition 16
 tandem HDDA/TDDA 426
 taxodione 466
 terminal alkynes 18, 75, 113, 162, 227–232, 235–239, 247–248, 251, 253, 437, 469
 α -(*tert*-butoxycarbonylamino)acrylic acid methyl ester 118
tert-butyldimethylsilyl (TBDMS) group 329
tert-butylisocyanide 159
 tetrabenzoheptaphenes 187
 tetrabenzopentaphenes 49–50
 1,2,4,5-tetrabromobenzene 40
 tetrabutylammonium
 difluorotriphenylsilicate (TBAT) 13, 141, 283, 454
 tetrabutyl ammonium fluoride (TBAF) 13, 42–43, 50, 59, 62, 79–80, 85, 126, 155, 271, 458
 tetrabutyl ammonium iodide (TBAI) 172–173, 224
 tetrabutylammonium triphenyldifluorosilicate (TBAT) 13, 141, 283–284, 454
 tetracenes 33–35, 39, 43, 45
 tetracenomycins C and X 472, 473
 tetrachlorothiophenedioxide 33
 tetrahydrobenzenes 7
 tetrahydro-Diels–Alder (TDDA) reaction 408–409, 411, 426, 435
 tetraepoxydecacene 39–40
 tetrahydrofuran (THF) 13, 85, 135, 163, 172–173, 241, 345, 409, 422, 435, 455, 458, 465, 467
 tetrahydroisoquinoline skeleton 470

- tetrahydro naphthalenes via Diels–Alder reaction 394
- 1,2,3,6-tetrahydropyridine-2-carboxylate 273
- 1,2,4,5-tetraiodobenzene 194
- β -tetralone 124
- 2,2,6,6-tetramethyl-1-piperidinyloxy (TEMPO) 40
- tetramethylpyrrole 36
- tetra-n*-butylammonium fluoride 183
- tetraphenylcyclopentadienone (TPCPD) 29, 37, 366, 393, 424, 425
- tetraphenyltetrabenzoheptacene 41, 42
- thiacycloalkyne 387
- thianaphthene-2,3-dicarboxylic acid anhydride 363
- thianthrene 136
- 3,4-thiophyne 364
- thioxantone synthesis 133
- Thummel's synthesis 33
- tosylhydrazine 164, 165, 239–240
- toxyloxanthone B 451
- transition metal-catalyzed reactions 18, 149, 183–261, 315, 354, 474–477
- transition metal catalyzed three-component coupling reactions
- copper 230–239
 - Ni-catalyzed arynes 230
 - palladium-catalyzed arynes 225–230
 - silver 239–2407
- 4-trialkylsilyl-3-pyridyl triflate 368, 369
- tricarbonyl compound 126
- tricyclobutabenzene (TCBB) 350–352
- tridehydrobenzenes 7
- triepoxypentacene 39
- triflones 303–304
- trifluoroacetic acid (TFA) 36, 155–156
- 2-(trifluoroacetylamino)pyridine 114
- trifluoromethoxide anion 173
- trifluoromethoxylation–bromination products 173
- 3-(triflyloxy)aryne intermediate 119
- 3-triflyloxy arynes 12, 136
- 3-triflyloxybenzyne 114, 303
- triflyloxy (OTf) group 319
- triflyloxy (OTf)-substituted benzocyclobutenones 179, 180
- 1,2,3-trifunctionalization, of aromatic ring 172
- 1,2,3-trifunctionalization of arynes 303
- trikentrins 462
- trimerization 2
- 2-(trimethylsilyl)aryl triflates 12, 149
- trimethylsilyl (TMS) group 173, 319–322, 328, 337, 339, 344–345, 348
- 2-(trimethylsilyl)-1,3-phenylene bis(trifluoromethanesulfonate) (TPBT) 1, 337
- 3-(trimethylsilyl)pyridin-2-yl trifluoromethanesulfonate 367
- triphenylene 2, 12, 31, 52, 185, 191–192, 197, 202, 324
- triphenylphosphine 114, 118, 159, 303
- triple bond 2–5, 36, 69, 77, 171–172, 180, 267, 280, 286, 321, 330, 333, 370, 384, 424, 431, 436, 446
- tritycene sensors, for explosives 49
- triscoranylene, synthesis of 57
- triyne precursors 445, 477
- tubingensin A 381, 384, 454–455
- tubingensin B 381, 384, 469
- turkiyenine 456–457
- tylophorine 210, 476, 477
- U**
- Uchiyama's conditions 319
- ultra-high vacuum (UHV) 27, 39–40, 53
- urea insertion onto hetarynes 379
- UV spectra 3
- V**
- vicinal carbon
- carbon/carbon–carbon bond-forming reactions of arynes 289–292
 - carbon/carbon–heteroatom bond-forming reactions of arynes acyl hydrazides 298, 299

- 1-aryl-3,4-dihydroisoquinolines 299, 300
 - aryl sulfonamides 299, 300
 - aryne-triggered aza-Claisen rearrangement of tertiary allylic amines 293, 294
 - aryne-triggered propargyl Claisen rearrangement 294, 295
 - diazo compounds 296, 297
 - N*-hydroxyindoles 295
 - nitrosoarenes 296
 - pyridine *N*-oxides 298
 - thioamides 296, 297
 - three-component reaction of arynes, tertiary aromatic amines, and carbon dioxide 301, 302
 - three-component reaction of arynes, tertiary aromatic amines, and carbonyl compounds 301
 - heteroatom/carbon–heteroatom bond-forming reactions of arynes 302
 - vineomycinone B₂ methyl ester 348–350, 472
 - vinylous quinolinium imides 93
 - vinyl sulfoxides 302–303
 - 1-vinyl-1,2,3,4-tetrahydroisoquinolines 273
 - vitamine E core 452
- W**
- welwitindolinone alkaloid 454–455
 - Woodward–Hoffmann rules 30–31, 122
 - Wudl's synthesis
 - of benzo-fused substituted heptacene 43
 - of heptacene 38
 - Wurtz reaction 2
- X**
- X-ray crystallography 4, 212, 222, 363
 - xylopinine 453
- Z**
- Zhang's synthesis, of dodecatwistacene 42
 - zwitterionic 2, 10, 70, 103, 136, 162, 267–268, 303, 421, 454

