

Synthetic Chemistry Literature Review 2021–22

Session 1

(Hetero)aromatic Cross-Coupling: C–C Bond-Formation

4. New Bench-Stable & Highly Active Palladium(0) Precatalysts
5. Anhydrous, Homogeneous Suzuki Miyaura Cross-Coupling with B(OMe)₃
6. Base-Activated Latent Heteroaromatic Sulfinates as Nucleophilic Coupling Partners
7. Screening of Nickel-Catalysed Suzuki-Miyaura Conditions for Process Scale
8. Decarbonylative Pd-Catalysed Suzuki Reaction for Heterobiaryl Synthesis
9. Heterobiaryl Synthesis *via* Reductive Cross-Coupling
10. α -Selective Heck-Type Coupling *via* Sulfonyl Radical Conjugate Addition
11. Phthalimide Additive Dramatically Improves Metallaphotoredox Decarboxylative Arylation
12. sp^3 – sp^2 Coupling of Alkyl Bpins and (Hetero)Aryl Halides *via* Amino Radical Transfer
13. sp^3 – sp^2 Coupling of Alkyl Bpins and (Hetero)Aryl Bromides *via* Energy Transfer
14. S_NAr-Decarboxylation for C(sp^2)–C(sp^3) Bond Formation
15. C(sp^3)–C(sp^2) Coupling with Acetals as Alcohol-Derived Radical Sources
16. Metallaphotoredox Arylation of Alcohols
17. Formal Cross-Electrophile Coupling of Alcohols with Aryl and Alkenyl Halides
18. Deaminative Arylation of Sterically Hindered Primary Amines
19. Expanding the Scope of Reductive C(sp^3)–C(sp^2) Coupling Using Electrochemistry
20. Cross-Electrophile Coupling of Strained Ring Redox-Active Esters with (Hetero)aryl Halides
21. Enantioconvergent Cross-Coupling of Styrene Oxides with Aryl Iodides
22. Reductive Cross-Coupling of Aliphatic Aldehydes with Aryl Bromides
23. Enantioselective Addition of Aryl Iodides Across Aldehydes

(Hetero)aromatic Cross-Coupling: C–X Bond-Formation

25. Chiral Arylated Amines *via* C–N Coupling
26. Enabling Reductive C–N Cross-Coupling of Nitroalkanes and Boronic Acids
27. Chemoselective Primary Amination of Aryl Boronic Acids
28. Nickel-Catalysed O-Arylation of Tertiary Alcohols
29. Chemoselective, Scalable Nickel-Electrocatalytic O-Arylation of Alcohols
30. Nickel-Catalysed Synthesis of Diaryl Ethers
31. S_{RN}1 Hydroxylation of Aryl Halides with Oximes
32. Decarboxylative Hydroxylation of (Hetero)aryl Carboxylic Acids
33. A Unified Approach to Decarboxylative Halogenation of (Hetero)aryl Carboxylic Acids
34. Decarboxylative Borylation and Cross-Coupling of (Hetero)aryl Carboxylic Acids
35. Deaminative Chlorination of Aminoheterocycles
36. Thioetherification of Aryl Halides with Thioacetates

Session 2

(Hetero)aromatic C–H Functionalisation

38. Radical *ortho*-C–H Amination to Access *ortho*-Sulfonyl Anilines
39. Catalytic Electrophilic Halogenation of Electron-Poor Arenes
40. Cytochrome P450 Inspired Aromatic C–H Hydroxylation
41. Undirected *meta*-Selective C–H Borylation of Monosubstituted Arenes
42. Tunable *meta*- or *para*-Selective C–H Borylation of Aryl Sulfonyl Compounds
43. Convenient Synthesis of 2-Aminopyridines
44. P^{III}/P^V-Catalysed Three-Component Assembly of 2-Amidopyridines
45. C(2)-Selective Amination & Amidation of Pyrimidines *via* Iminium Salt Intermediates
46. Regioselective, Non-Cryogenic Magnesiations of Functionalised (Hetero)arenes
47. Pyridine C–H Alkylation *via* Wittig Olefination of Dearomatized Pyridylphosphonium Ylides

Heterocycle & Carbocycle Synthesis

49. Scaffold Hopping by Net Photochemical Carbon Deletion of Azaarenes
50. Dehydrogenative Synthesis of Benzoxazoles from Ketones and Primary Amines
51. Odour-Free Synthesis of Functionalised Isothiazoles
52. Regioselective Synthesis of *N*²-Substituted 1,2,3-Triazoles
53. Bifunctional Sulfilimines Enable Synthesis of *N*-Heterocycles from Alkenes
54. Modular Synthesis of NH-Unprotected Spiropyrrolidines and Spiroisindolines
55. Aldehydes as Diazo Surrogates for Cyclopropanation and Other Carbene Reactivity
56. Cyclopropanes from α,α -Dialkylated Sulfones as Carbene Precursors
57. Asymmetric Synthesis of Tertiary and Secondary Cyclopropyl Boronates
58. Ti-Catalysed Diastereoselective Cyclopropanation
59. Photosensitised [2+2] Cycloadditions of Alkenylboronates with Alkenes
60. [3+2] Cycloaddition of Cyclopropanes and Alkenes *via* Boronyl Radical Catalysis
61. Direct Alkyl-Arylation of [1.1.1]Propellane *via* Ni-Metallaphotoredox Catalysis
62. Synthesis of Nitrogen-Substituted Bicyclo[1.1.1]pentanes *via* Electrophilic Activation
63. Intermolecular [2 π +2 σ]-Photocycloaddition

Aliphatic C–C Bond-Formation

65. Conjugate Alkylation *via In Situ* Deoxygenation of Alcohols
66. Enantioselective Synthesis of α,α -Dialkyl Alcohols from Redox-Active Esters
67. Reductive Cross-Coupling of 3 Carboxylic Acids with 1 Alkyl Bromides *via* S_H2 Mechanism
68. Decarboxylative Alkylation of Carboxylic Acids with Alcohols
69. Formal Cross-Coupling of Amines and Carboxylic Acids
70. Doubly Decarboxylative C(sp³)–C(sp³) Bond Formation
71. Electrochemical Cross-Electrophile Coupling of Alkyl Halides
72. Automated Iterative C(sp³)–C Bond Formation

Session 3

Aliphatic C–X Bond-Formation

74. Enantioselective, Organocatalytic Synthesis of α -Aryl Glycines from Sulfoxonium Ylides
75. Amino-Oxetanes as Amide Isosteres
76. Biocatalytic Reductive Amination of Alkyl (Hetero)aryl Ketones
77. Multifunctional Biocatalyst for Conjugate Reduction and Reductive Amination
78. Nitrile-Amine Coupling for General Amine Synthesis
79. Photochemical Decarboxylative C–N & C–O Cross Couplings via Radical-Polar Crossover
80. Supporting-Electrolyte-Free Anodic Oxidation of Oxamic Acids into Isocyanates
81. Enantioenriched α -Amino Acids *via* Stereocontrolled 1,3-Nitrogen Migration

Aliphatic C–H Functionalisation

83. Enantioselective α -(Hetero)aryl Amine Synthesis *via* Ni/Photoredox Dual Catalysis
84. Nickel-Catalysed C(sp³)–H Arylation or Alkylation Without Photo- or Electrochemistry
85. Late-Stage *N*-Me Selective Arylation of Trialkylamines
86. α -C–H Alkylation of Trialkylamines *via* Reversible Hydrogen Atom Transfer Catalysis
87. Photocatalytic Hydroaminoalkylation of Unprotected Primary Alkylamines with Styrenes
88. Electrochemical, Late-Stage C(sp³)–H Methylation or Alkylation of Protected Amines

Functional Group Interconversions & Isomerisations

90. Acceptorless Dehydrogenation of Aliphatics
91. Catalytic, contra-Thermodynamic Positional Isomerisation of Alkenes
92. Epimerisation of *cis*-Diols to *trans*-Diols Using Reversible HAT
93. Epimerisation of *trans*-Diols to *cis*-Diols Using Boron Complexation
94. Chemoselective Electrosynthesis Using Rapid Alternating Polarity
95. α -Tertiary Amines and Alcohols *via* Desymmetrising Reduction of Malonic Esters
96. Deracemisation of α -Chiral Aldehydes *via* *E/Z* Photoisomerisation of Enamines
97. Catalytic Reduction of Carboxylic Acids
98. Nucleophilic Deprotection of Carbamates Compatible with Reducible Groups
99. Nickel-Catalysed Asymmetric Hydrogenation of Oximes
100. Oxime *E*→*Z* Photoisomerisation & Non-Classical Beckmann Rearrangement
101. N–N Bond Formation by Reductive Cross-Coupling of Nitroarenes and Anilines
102. Chemoselective (Hetero)arene Electroreduction
103. Scalable, Ammonia-Free Birch Reduction
104. Electrochemical Activation of Photoredox Catalysts Inducing Photoreductant Activity

Session 4

Sulfur & Phosphorus Functional Groups

106. Enantioselective Synthesis of Sulfinic Esters as Entry Point to Other S-Functional Groups
107. Direct Photocatalytic Decarboxysulfonylation of Alkyl Carboxylic Acids
108. Modular, Photocatalytic Synthesis of Aryl Sulfones from Alkyl Carboxylic Acids
109. α -(Hetero)arylation of Sulfoximines *via* S_NAr
110. One-Pot Access to Diverse Sulfur-Nitrogen FGs from Aryl Boroxines
111. Modular Synthesis of Sulfonimidamides
112. Modular, Two-Step Route to Sulfondiimidamides
113. Catalytic, Enantioselective Synthesis of Stereogenic P(V) Compounds

Fluorination and Fluorinated Motifs

115. Photochemical Defluorinative Functionalisation of Amides and Esters *via* C–F Activation
116. *gem*-Difluoroallylation of Aryl Halides
117. Defluoroarylation of Trifluoromethylarenes
118. Defluorofunctionalisation of Trifluoromethylarenes
119. Deoxytrifluoromethylation of Alcohols
120. Trifluoromethoxylation of (Hetero)aromatics
121. Mechanochemical Conversion of Anilines to Aryl Trifluoromethyl Ethers
122. C(3)-Selective Tri- and Difluoromethylthiolation of Pyridines

Technologies for Synthesis

124. Radicals and Photocatalysis
125. Photocatalysis (cont.)
126. Photocatalysis (cont.)
127. Photochemistry with Transition Metals or Organocatalysts + Enantioselective Protocols
128. Electrochemistry
129. Electrochemistry: Mergers with Photochemistry and Other Catalysis Modes
130. Biocatalysis
131. Biocatalysis: Reaction Types ('Natural' Enzyme Reactivity)
132. Biocatalysis: Reaction Types ('Unnatural' Enzyme Reactivity)
133. Biocatalysis: Combinations with Other Catalysis Modes or Techniques
134. Flow Chemistry
135. Reaction Screening and High-Throughput Experimentation
136. Automation
137. Data Science, Digitisation, and Machine Learning
138. Data Science, Digitisation, and Machine Learning (cont.)
139. Reaction Monitoring