Deoxygenative Transformation of Carbonyl and Carboxyl Compounds Using gem-Diborylalkanes

For aldehydes & ketones

\[ R^+ \text{OBpin} \rightarrow E^+ \text{OBpin} \rightarrow E\text{R'} \]

via B–O elimination

For carboxylic acid derivatives

\[ R^+ \text{OBpin} \rightarrow X = \text{OH OR'' etc.} \rightarrow E^+ \text{E} \text{R'} \]

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Thiadiazoloquinoxalines

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M. Baumgarten*
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Thiadiazoloquinoxalines made soluble and core-extended
Controlled-Coupling of Quinone Monoacetals by New Activation Methods: Regioselective Synthesis of Phenol-Derived Compounds

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Cluster Cover Page

Cluster Preface: Electrochemical Synthesis and Catalysis

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Recent Advances in Electrochemical Oxidative Cross-Coupling for the Construction of C–S Bonds

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Metallaelectro-Catalyzed C–H Activation by Weak Coordination

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Electrochemical Synthesis of 2-Hydroxy-para-terphenyls by Dehydrogenative Anodic C–C Cross-Coupling Reaction

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Electrochemical C(sp³)–H Fluorination

Y. Takahira
M. Chen
Y. Kawamata
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S. H. Reisberg
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Electrochemical C(sp³)–H fluorination

• >20 examples
• unactivated
• 2° & 3° C(sp³)–H
• mild conditions
• scalable
• comparison with lit. methods

Efficient Flow Electrochemical Alkoxylation of Pyrrolidine-1-carbaldehyde

N. Amri
R. A. Skilton
D. Guthrie
T. Wirth*
Cardiff University, UK

Efficient Flow Electrochemical Alkoxylation of Pyrrolidine-1-carbaldehyde

6 examples
≤ 94% conversion to monoalkoxy product
≤ 83% conversion to dialkoxy product

Phthalocyanines as a π–π Adsorption Strategy to Immobilize Catalyst on Carbon for Electrochemical Synthesis

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Phthalocyanines as a π–π Adsorption Strategy to Immobilize Catalyst on Carbon for Electrochemical Synthesis

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A Flow Microreactor Approach to a Highly Efficient Diels–Alder Reaction with an Electrogenerated o-Quinone

K. Tanaka
H. Yoshizawa
M. Atobe*
Yokohama National University, Japan

Three-Component Chlorophosphinoylation of Alkenes via Anodically Coupled Electrolysis

L. Lu
N. Fu
S. Lin*
Cornell University, USA

Diastereodivergent Synthesis of Bromoiminolactones: Electrochemical and Chemical Bromoiminolactonization of α-Allylmalonamides

K. Yamamoto
K. Ishimaru
S. Mizuta
D. Minato
M. Kuriyama
O. Onomura*
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1,10-Phenanthroline- or Electron-Promoted Cyanation of Aryl Iodides

K. Mitsudo*  
K. Yoshioka  
T. Hirata  
H. Mandai  
K. Midorikawa  
S. Suga*  
Okayama University, Japan  

R4N-CN  
1,10-phenanthroline  
or  
electroreduction  
# transition metal free  
# strong base free  
10 examples ≤ 78% yield

Cathodic Reduction of Caffeine: Synthesis of an Amino-Functionalized Imidazole from a Biobased Reagent

F. Pandolfi  
I. Chiarotto  
L. Mattiello  
D. Rocco  
M. Feroci*  
Sapienza University, Italy

\[ \text{Biobased} \rightarrow \text{electrochemical} \rightarrow \text{Chemical} \]

1) NaOH/water, reflux, 2 h  
2) HCO2H/(CH3CO)2O, 55 °C, 2 h, rt, 12 h  
(12 examples)  
51% (one step)  
29% (two steps)

Electrochemical Deoxygenation of N-Heteroaromatic N-Oxides

P. Xu  
H.-C. Xu*  
Xiamen University, P. R. of China  

\[ \text{undivided cell} \rightarrow \text{Electrochemical} \rightarrow \text{Chemical} \]

\[ \text{R-N}=\text{O} \rightarrow \text{EANF}_{6} (0.2 \text{ equiv}) \text{MeCN/H}_{2} \text{O (4:1), 80 °C} \]

14 examples up to 80% yield
Oxidative Cyclization of Naphtholic Sulfonamides Mediated by a Chiral Hypervalent Iodine Reagent: Asymmetric Synthesis versus Resolution

N. Jain  
J. E. Hein*  
M. A. Ciufolini*  
The University of British Columbia, Canada

MCPBA, CH₂Cl₂, –20 °C

\( \begin{align*} 
\text{HO} & \quad \text{R}^2 \\
\text{NHCOMes} & \quad \text{t-Bu} \\
\text{SO}_2 & \quad \text{R}^1 \\
\end{align*} \)

\( \begin{align*} 
\text{NHCOMes} & \quad \text{R}^1 \\
\text{I} & \quad \text{Bu}^+ \\
\end{align*} \)

\( \text{R}^2 \quad \text{N} \quad \text{O} \quad \text{R}^1 \quad \text{O} \quad \text{NHCOMes} \)

\( \text{R}^1 = \text{Me}, \text{R}^2 = \text{Cl} \)

\( 11–67\% \text{ ee}, \approx 20\% \text{ yield} \)

Crystallizes as a conglomerate

Coupled Preferential Crystallization (CPC) enables the resolution of large amounts of racemate starting with 3–4 mg of >99% ee material

Asymmetric Synthesis of cis-(S,R)-3-Amino-4-fluoro-1-methylpyrrolidine

Z. Fei  
X. Xiong  
C. Cheung  
W. Liu  
Q. Shen  
J. Zhang  
H. Gao  
J. Bian*

Suzhou Novartis Pharma Technology Co., Ltd, P. R. of China

DAST, DCM

\[ \text{SO}_2\text{CF}_3 (1 \text{ atm}) \]

(3,6-dimethylphenoxide)

\[ \text{DMF, rt, 24 h} \]

72%

Complete retention

Complete inversion

One-Pot Synthesis of Spiro-2H-pyrroles from N-Propargylic \( \beta \)-Enaminones

E. Karadeniz  
M. Zora*

Middle East Technical University, Turkey

\[ \text{R}^1 = \text{Ph}; \text{R}^2 = \text{Ph}, \text{p-Cl-C}_6\text{H}_4 \\
\text{R}^3 = \text{Ph}, \text{p-CH}_3\text{C}_6\text{H}_4, \text{p-F-C}_6\text{H}_4, \text{p-NO}_2\text{C}_6\text{H}_4, \text{m-Br-C}_6\text{H}_4 \]

\[ \text{Cs}_2\text{CO}_3 \]

DMSO, 80 °C

8 examples up to 75% yield
Intramolecular Aldol Ring Closures of Cysteine Derivatives Leading to Densely Functionalised Pyroglutamates

H. Almahli
N. C. Jimenez
M. G. Moloney*
The University of Oxford, UK

\[
\text{R}^2 = \text{t}-\text{Bu}, \text{i}-\text{Pr}, \text{Ph}, \text{o}-\text{FC}_6\text{H}_4, \text{o}-\text{CF}_3\text{C}_6\text{H}_4; \text{R}^2 = \text{H}, \text{MeO}, \text{CH}_2\text{CHCH}_2-, \text{p}-\text{BrC}_6\text{H}_4; \text{R}^2 = \text{H}, \text{Me}
\]

Amino Acid Salt Catalyzed Asymmetric Addition Reaction of Acetylacetone to Maleimides and 2-(2-Oxindolin-3-ylidene)malononitriles

H. Wu
H. Liu
J. Li
X. Li*
H.-P. Xiao
J. Jiang*
Wenzhou University, P. R. of China

\[
\begin{align*}
n = 1, X = \text{H}, & 24\% \text{ yield, } 0\% \text{ ee} \\
n = 2, & \text{Ba, up to } 99\% \text{ yield, } 76\% \text{ ee}
\end{align*}
\]

Synthesis of 3-Halo-7-azaindoles through a 5-endo-dig Electrophilic Cyclization Reaction

A. Philips
C. Cunningham
K. Naran
T. Kesharwani*
University of West Florida, USA

\[
\begin{align*}
\text{Yield } & 55-75\% \\
\text{R} = \text{alkyl, aryl, vinyl} \\
\text{Yield } & 45-97\%
\end{align*}
\]