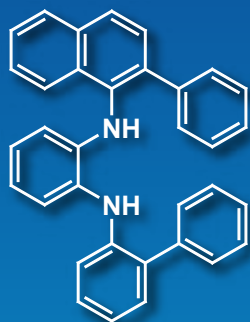


New

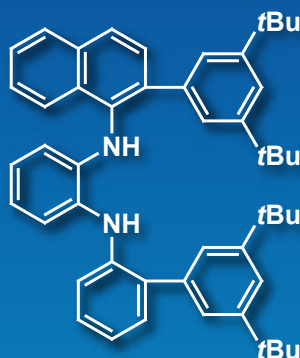
CHEMISTRY

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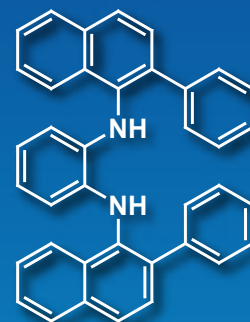
Diamine Ligands for Ullmann-Type Cross-Coupling at Room Temperature



N-([1,1'-biphenyl]-2-yl)-*N'*-(2-phenylnaphthalen-1-yl)benzene-1,2-diamine
250mg / 1g
[B6606]



*N*¹-(3',5'-di-*tert*-butyl-[1,1'-biphenyl]-2-yl)-*N*²-(2-(3,5-di-*tert*-butylphenyl)naphthalen-1-yl)benzene-1,2-diamine
250mg / 1g
[D6240]

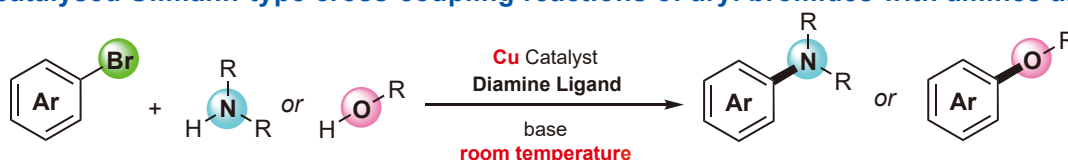


N,N'-Bis(2-phenylnaphthalen-1-yl)benzene-1,2-diamine
250mg / 1g
[B6801]

Advantages

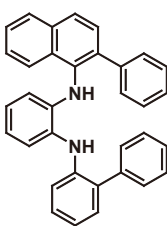
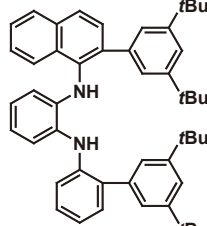
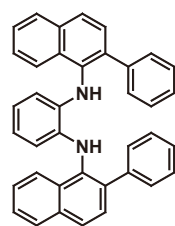
- Enables cross-coupling of aryl bromides as substrates at room temperature
- Leads to cost-effective and sustainable process development due to the copper-catalysed reaction
- Applicable to a wide range of substrates, including base-sensitive five-membered heteroaryls

Copper-catalysed Ullmann-type cross-coupling reactions of aryl bromides with amines and alcohols ¹⁾



C(sp²)-N and C(sp²)-O bonds are ubiquitous structures in functional compounds such as pharmaceuticals. Therefore, Ullmann-type cross-coupling reactions are gathering more and more attentions, which can construct such structures effectively.

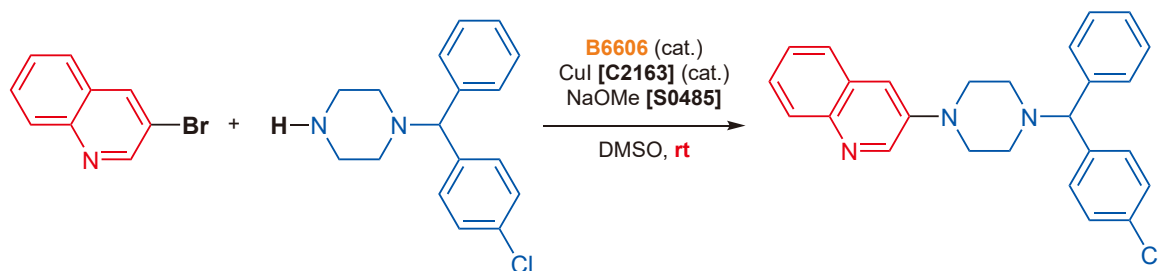
Ligand selection guide

Ligand	 [B6606]	 [D6240]	 [B6801]
Suitability	<ul style="list-style-type: none"> • C(sp²)-N cross coupling ²⁾ • Effective for the substrates such as aryl bromides, primary amines and secondary amines (both cyclic and acyclic) with relatively small steric hindrance 	<ul style="list-style-type: none"> • C(sp²)-N cross coupling ²⁾ • Prevented from self-degradation of a ligand by the <i>tert</i>-butyl group • Particularly effective for bulky substrates 	<ul style="list-style-type: none"> • C(sp²)-O cross coupling ³⁾ • C(sp²)-N cross coupling with a weak base, NaOTMS ⁴⁾ • Effective for base-sensitive five-membered heteroarenes as substrates • Allows for switching N/O selectivity depending on base

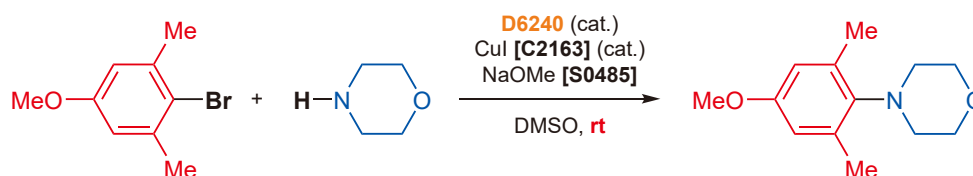
Diamine Ligands for Ullmann-Type Cross-Coupling at Room Temperature

Applications

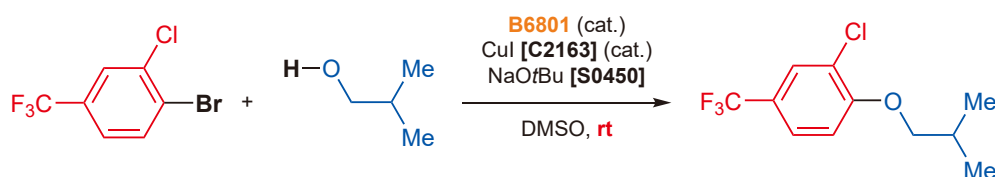
C(sp²)-N Cross-Coupling Reaction ²⁾



C(sp²)-N Cross-Coupling Reaction of Ortho-Substituted Aryl Bromides ²⁾



C(sp²)-O Cross-Coupling Reaction ³⁾



Cross-Coupling Reaction with Base-sensitive Five-membered Heteroarenes ⁴⁾



- References**
- 1) Q. Yang, Y. Zhao, D. Ma, *Org. Proc. Res. Dev.* **2022**, 26, 1690. <https://doi.org/10.1021/acs.oprd.2c00050>
 - 2) S. Kim, M. J. Strauss, A. Cabré, S. L. Buchwald, *J. Am. Chem. Soc.* **2023**, 142, 6966. <https://doi.org/10.1021/jacs.3c00500>
 - 3) M. J. Strauss, S. L. Buchwald, *et al.*, *Angew. Chem. Int. Ed.* **2024**, 63, e202400333. <https://doi.org/10.1002/anie.202400333>
 - 4) M. J. Strauss, S. L. Buchwald, *et al.*, *J. Am. Chem. Soc.* **2024**, 146, 18616. <https://doi.org/10.1021/jacs.4c05246>

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