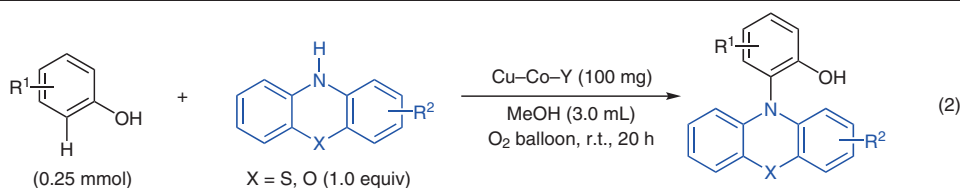
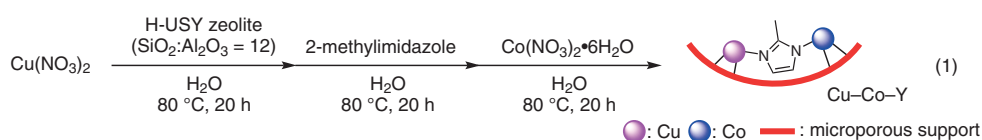


B. HUANG*, T. LIANG*, T. W. B. LO*, ET AL. (THE HONG KONG POLYTECHNIC UNIVERSITY, SHENZHEN AND HONG KONG, AND GUANGXI UNIVERSITY, NANNING, P. R. OF CHINA)

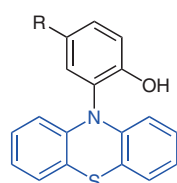
Cu–Co Dual-Atom Catalysts Supported on Hierarchical USY Zeolites for an Efficient Cross-Dehydrogenative C(sp²)–N Coupling Reaction

J. Am. Chem. Soc. **2023**, *145*, 8464–8473, DOI: 10.1021/jacs.3c00114.

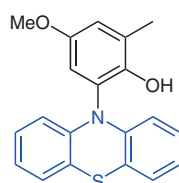
Cross-Dehydrogenative C(sp²)–N Coupling by a Cu–Co Dual-Atom Catalyst Supported on Hierarchical Zeolite



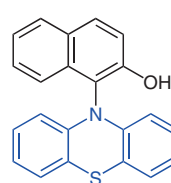
Results:



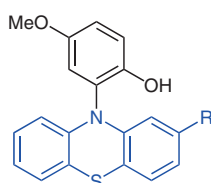
R = OMe: 81% yield
 R = OPh: 50% yield
 R = OBn: 68% yield
 R = H: 100% (*o*–*p*–*o*, *p*–*p*–*o*)



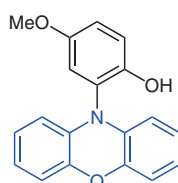
69% yield



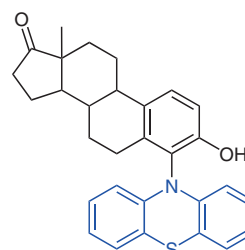
73% yield



R = CF₃: 79% yield
 R = Cl: 80% yield
 R = CN: 73% yield



82% yield



n.d.

Significance: A copper–cobalt dual-atom catalyst supported on hierarchical USY zeolites (Cu–Co–Y), prepared according to eq. 1, promoted the cross-dehydrogenative coupling of unprotected phenols with phenothiazines and phenoxazine under an O₂ atmosphere to give the corresponding C–N-coupled products in up to 82% yield (eq. 2).

Comment: Cu–Co–Y was characterized by means of N₂ adsorption-desorption isotherm, XRF, MALDI-TOF/TOF-MS, SXRD, TEM, EDX, UV/Vis, XPS, and XANES analyses. In the reaction of 4-methoxyphenol with phenothiazine, the catalyst was recovered and reused four times with gradual loss of its catalytic activity (fresh: 81%, 6th run: 65%).

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Category

Polymer-Supported Synthesis

Key words

copper catalysis
 zeolite

cross-dehydrogenative coupling

phenols

phenothiazines

Synfact of the Month

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