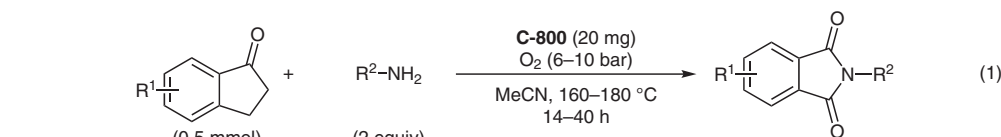


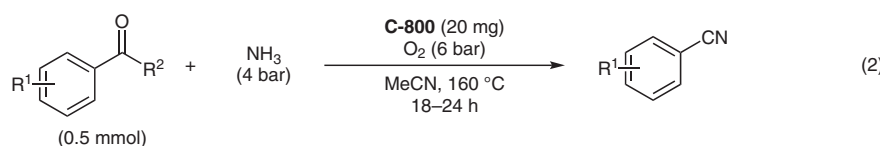
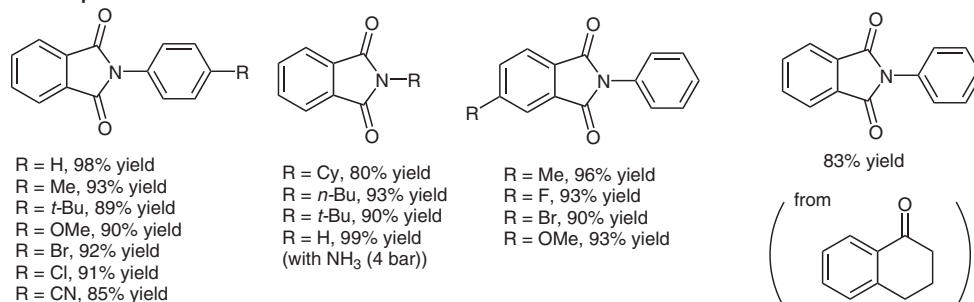
X. LIU, J. QIN, W. DAI*, Z. ZHU, P. ZHOU, Y. WANG, J. NIE, Y. YANG, Z. ZHANG*
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Metal-Free and Additive-Free Synthesis of Imides and Nitriles from Ketones via Oxidative Cleavage of C(O)–C Bonds
ACS Catal. **2022**, *12*, 13300–13311, DOI: 10.1021/acscatal.2c02847.

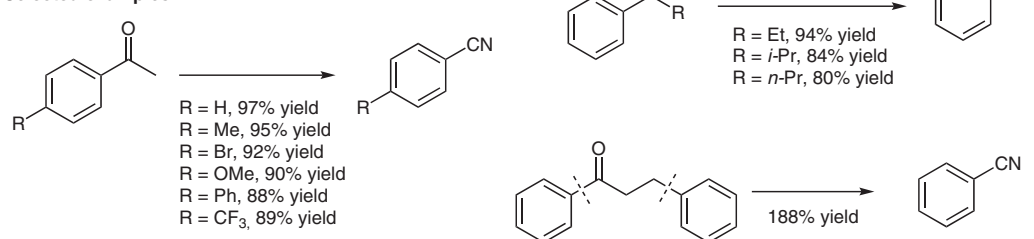
Metal-Free Oxidative C–C Bond Cleavage of Ketones Promoted by Biomass-Derived Carbons



Selected examples:



Selected examples:



Significance: A carbon material (C-800), prepared by the pyrolysis of biomass (bamboo) with K₂CO₃ at 800 °C, promoted the C(carbonyl)–C bond cleavage of aromatic cyclic ketones with amines and O₂ to give the corresponding phthalimides in up to 99% yield (eq. 1). C-800 also cleaved the C(carbonyl)–C bonds and C (benzylic)–C bonds of acyclic ketones with NH₃ and O₂ at 160 °C to give the corresponding aryl nitriles in up to 97% yield (eq. 2).

Comment: In the reaction of acetophenone with NH₃, the catalyst was recovered by centrifugation and reused five times without significant loss of its catalytic activity. Experimental and computational studies suggested that functional oxygen groups on the surface of the catalyst adsorbed ketones and that the defective sites of the catalyst activated O₂ to generate a superoxide radical.

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