S. MA,* Z. YU, Z. GU (SHANGHAI INSTITUTE OF ORGANIC CHEMISTRY, P. R. CHINA)
Pd^{II}-Catalyzed Oxidative Dimeric Cyclization-Coupling Reaction of 2,3-Allenoic Acids: An Efficient Synthesis Bibutenolide Derivatives
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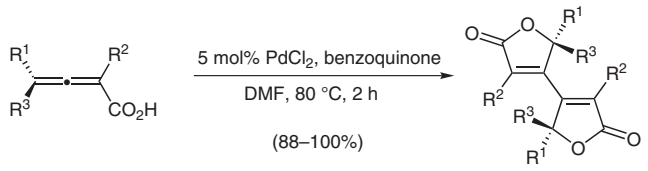
Category
Synthesis of Heterocycles

Key Words
allenes
butenolides
homogeneous catalysis
palladium

An Efficient Synthesis of Bibutenolides from 2,3-Allenoic Acids



R^1, R^2, R^3 = H, alkyl, aryl

Significance: A new catalytic system for the preparation of dibutenolides by a cyclization-coupling reaction of 2,3-allenoic acids is described. Three different catalytic systems involving Pd(II) and corresponding additives have been developed, in which the key step is the regeneration of the Pd(II) species to complete the catalytic cycle. The bicyclization reaction gives excellent yields and diastereoselectivity using optically active 2,3-allenoic acids.

Comment: Allenes possess great potential in organic synthesis as chirality transfer agents (*Allenes in Organic Synthesis*; H. F. Schuster, G. M. Coppola, Eds.; Wiley: New York, **1984**, pp 1-8; S. Ma, Q. Yu *J. Org. Chem.* **2003**, *68*, 6149-6152). Increasing interest in this area includes the use of functionalized allenes to form a variety of cyclic compounds in Pd-catalyzed coupling reactions (S. Ma, H. Xie *J. Org. Chem.* **2002**, *67*, 6575-6578). Although naturally occurring dibutenolines are not known, butenolides are common units in many bioactive natural products, including the well know vitamin C.

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