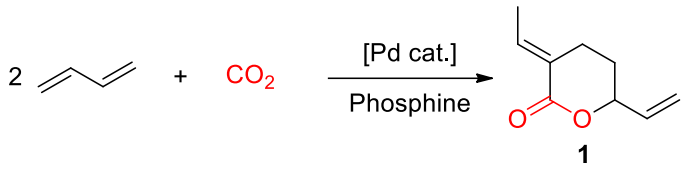
Title; Selective Palladium-catalyzed Synthesis of Diesters: Alkoxycarbonylation of a CO_2-butadiene derived δ--lactone

Muhammad Sharif, *

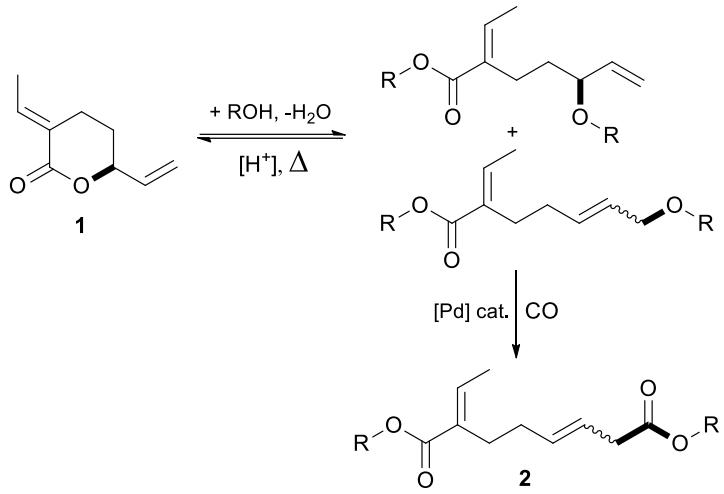
Abstract;

The development of sustainable processes for chemical synthesis, energy and petrochemical technologies is one of the major challenges and noteworthy task for 21sr century. Notably, catalysis is a key technology for achieving more sustainable processes in the chemical, pharmaceutical and material industries. Currently, more than 80% of all chemical products are made via catalysis. In this regard, the development of more selective, cost-effective and durable catalysts constitutes a key factor for the production of all kinds of chemicals today and in the future.

Novel unsaturated C_{10} diesters are produced via alkoxycarbonylation of δ-lactone **1** (3-ethylidene-6-vinyltetrahydro-2*H*-pyran-2-one), derived from the telomerization of CO_2 and butadiene. Key for the selective valorization of **1** is the use of a catalytic system based on $PdCl_2$, a chelating phosphine bearing electron-withdrawing groups and an acidic promoter. The unsaturated C_{10} methyl diester can be easily hydrogenated on Pd/C under mild conditions to afford its corresponding saturated diester. Subsequent hydrogenation using the homogeneous $[Ru(acac)_3]$/Triphos catalysts gives 2-ethyloctane-1,8-diol in high yield. The overall procedure allows synthesizing new building blocks for the manufacturing of renewable polymers and polymers processing materials.



Scheme 1



Scheme 2

References

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