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An improved method for cyclization of 2,6-dimethyl-hept-5-en-2-ol

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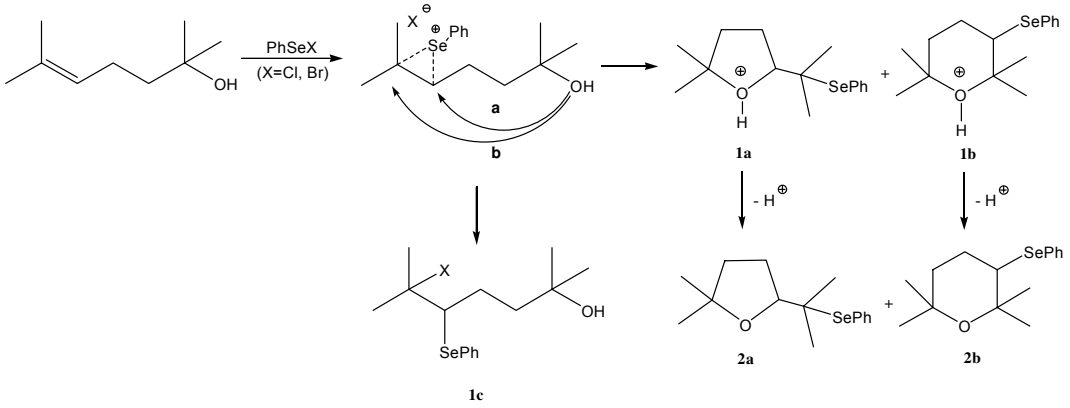
Phenylselenoetherification of unsaturated alcohols using phenylselenenyl halides (PhSeX) as reagents is suitable pathway for generation of tetrahydrofuran- and tetodrahydropyran type of ethers, which are fragments of many natural products. [1] This methodology can be successively employed for cyclofunctionalization of primary and secondary alkenols, which give moderate to good yields of cyclic products, but in the case of tertiary alkenols the yields are significantly lower. [2]

Herein, we report the good influence of some Lewis acids and bases on the yields and regioselectivity of phenylselenoetherification of tertiary Δ^4- unsaturated 2,6-dimethyl-hept-5-en-2-ol in CH_2Cl_2 at room temperature. The five-and six-membered cyclic ethers ensue in phenylselenoetherification of this alkenol in the yield of 37% (ratio 55:45, respectively) with PhSeCl as reagent, while reaction with PhSeBr doesn't afford cyclic product.



In order to increase the yields and regioselectivity of reactions, equimolar amounts of Lewis bases (pyridine, quinoline, triethylamine and 2,2'-bipyridine) and acids ($CoCl_2$, $SnCl_2$) as additives were used. The use of bases caused the increasing of yields to almost quantitative, even in the case of PhSeBr. Distribution of products proceeds with higher regioselectivity than in the case of reactions without additive present, and tetrahydrofuran type of ether in excess in all investigated reactions was obtained. In the case with tin(II)chloride as additive, only five-membered cyclic ether is formed.

Literature:

[1] J. Blunt, B. Copp, M. Munro, P. Northcore, M. Prinsep, *Nat. Prod. Rep.* **2004,** *21*, 1.

[2] S. Konstantinovic, Z. Bugarcic, S. Milosavljevic, G. Schroth, M. Mihailovic, *Liebigs Ann. Chem.* **1992,** *3,* 261.