
Novel Acylation of a Vinyl Group by the Reaction of an Aldehyde and a Vinylelenonium Ylide.
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Vinylelenonium ylide, which was generated from (Z)-vinylelenonium salt with a base such as sodium or potassium hydride, reacted with aromatic aldehydes to produce the α,β-unsaturated ketones, which were obtained in better yields from the aldehydes with an electron-withdrawing group than from those with an electron-donating group. Based on the results from reactions using (vinyl-d)vinylelenonium salts on benz(aldehyde-d) the reaction mechanism was proposed.


Self-assisted Tandem Michael-aldol Reactions of α, β-Unsaturated Ketones with Aldehydes.
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The tandem Michael-aldol reaction of 1-{2-(methylsulfonyl)phenyl}prop-2-en-1-one (1) or the seleno congener 4 with p-nitrobenzaldehyde in the presence of BF₃·OEt₂ gave the Bayliss–Hillman adduct 2 or 5 and onium salt 3 or 6, respectively, and selenochromane 7 from 4. When the reaction mixture of 1 or 4 with p-nitrobenzaldehyde was worked up with 2 equivalents of triethylamine, 2 (75%) or 5 (64%) together with 7 (10%) was obtained.

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Syntheses and Reactions of Cyclic Se-Alkoxyselenuranes and Alkoxyselenonium Salts.
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Several 1-chloro-2,1-oxaselenole selenuranes, 5-chloro-5,11-epoxy-6,11-dihydrodibenz[b,e]selenepines and the corresponding selenium salts were synthesized and the differences in structures between the selenuranes and the selenium were studied by ¹H- and ⁷⁷Se-NMR spectroscopy. Their reactions with organometallic reagents were conducted and the reaction mechanism was discussed.

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Novel Ring Transformation of Dihydroselenines to Selenabicyclo[3.1.0]hexenes.
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Treatment of 2-bromo-2,6-dicyano-2,3-dihydroselenine with triethylamine in ethanol gave 2-selenabicyclo[3.1.0]hex-3-ene (1) in 77% yield. Reaction of 1 with benzene formed 2-cyanobenzo[selenophene in 35% yield. Methylation of 1 with methyl triflate produced Se-methylselenonium salt (2), which was transformed into 2-selenabicyclo[3.1.0]hex-3-ene-1-carboxamide (3) and 3-carboxamide (4). Compound (1) was converted into cyanoethylcyclopropane via selenium salt (2).