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SYNTHESIS OF cis-DEC-5-en-1-ol ACETATE – ONE OF THE COMPONENTS OF THE SEX PHEROMONE OF *Agrotis segetum*

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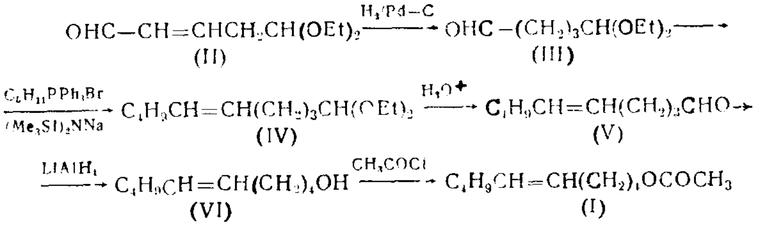
cis-Dec-5-en-1-ol acetate (I) is one of the main components of the pheromone of the turnip moth *Agrotis segetum (Lepidoptera Noctuidae)* that are responsible for the attraction of the males of this species under field conditions [1]. The traditional methods for the synthesis of the acetate (I) were based on the alkylation of lithium or sodium hexynylide with 2-(4-bromobutoxy)- or 2-(4-iodobutoxy)tetrahydropyran followed by the hydrogenation of the 2-(dec-5-enyloxy)tetrahydropyran to 2-(dec-5-enyloxy)tetrahydropyran and the conversion of the latter into (I).

We have performed a new synthesis of compound (I) starting from the readily available monoacetal of glutaconic aldehyde (II) [2]:



$$\underset{\text{(II)}}{OHC{-}CH{=}CHCH_2CH(OEt)_2} \xrightarrow{H_2/Pd-C} \underset{\text{(III)}}{OHC{-}(CH_2)_3CH(OEt)_2} \longrightarrow$$

$$\xrightarrow[(Me_3Si)_2NNa]{C_5H_{11}PPh_3Br} \underset{\text{(IV)}}{C_4H_9CH{=}CH(CH_2)_3CH(OEt)_2} \xrightarrow{H_3O^+} \underset{\text{(V)}}{C_4H_9CH{=}CH(CH_2)_3CHO} \longrightarrow$$

$$\xrightarrow{LiAlH_4} \underset{\text{(VI)}}{C_4H_9CH{=}CH(CH_2)_4OH} \xrightarrow{CH_3COCl} \underset{\text{(I)}}{C_4H_9CH{=}CH(CH_2)_4OCOCH_3}$$

Compound (II) was hydrogenated in the presence of 5% palladium on carbon to the monoacetal of glutaraldehyde (III), bp 53-57°C/2 mm, n_D^{20} 1.4282. The reaction of the aldehyde (III) with amyltriphenylphosphonium bromide under the conditions described by Bestmann et al. [3] gave a 63% yield of the acetal of cis-dec-5-enal (IV), with bp 93-98°C/3 mm, n_D^{20} 1.3312. The hydrolysis of the acetal (IV) gave a 60% yield of cis-dec-5-enal (V), bp 60°C/1 mm, n_D^{20} 1.3332, which was reduced with lithium tetrahydroaluminate with a yield of 85% to cis-dec-5-en-1-ol (V), bp 75-76°C/1 mm, n_D^{20} 1.4512. The alcohol (VI) was converted by acetylation with acetyl chloride into the final acetate (I), bp 140°C/4 mm, n_D^{20} 1.4396.

It was established by gas-liquid chromatography on a column (0.4 mm × 4.5 m) containing 15% of OV-275 on Chromosorb P, 100-120 mesh, that 4% of the trans isomer of (I) was present.

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