. The major product of the following reaction is $CH_3CH = CHCO_2CH_3 \xrightarrow{LiAlH_4}$ (2019 Main, 9 April (a) $CH_3CH = CHCH_2OH$ (b) $CH_3CH_2CH_2CH_2OH$

(c) CH₃CH₂CO₂CH₃ (d) CH₃CH₂CH₂CHO

Key Idea LiAlH₄ reagent is used for the reduction of —CHO, C OCH₃. It does not reduce double bonds.

The reaction of an ester with LiAlH₄ produces two alcohols, one corresponding to the acyl portion of the ester and one corresponding to the alkyl portion.

$$CH_3CH = CHC - OCH_3 \xrightarrow{\text{LiAlH}_4}$$

$$CH_3CH = CHCH_2OH + CH_3OH$$
But -2-en -1-ol Methanol

Thus, the major product of the given reactant

 $CH_3CH = CHCOCH_3$ in presence of LiAlH₄ CH₃CH = CH CH₂OH and CH₃OH. The reaction proceeds through following mechanism.

Mechanism

Techanism

CH₃CH = CH C OCH₃ + H AlH₃

CH₃CH = CH C OCH₃ + H AlH₃

CH₃CH = CH C OCH₃

CH₃CH = CH C OCH₃

CH₃CH = CH C OCH₃

H

CH₃CH = CH C + CH₃O

An aldehyde H

Nucleophilic acyl substitution reaction

H

CH₃CH = CH CH CH₃O

An aldehyde H

Nucleophilic acyl substitution reaction

CH₃CH = CH CH CH₃O

AlH₃

Teachion adollion

CH₃CH = CH CH₂OH
$$\frac{H^+}{H_2O}$$
 CH₃CH = CH C H

Primary alcohol