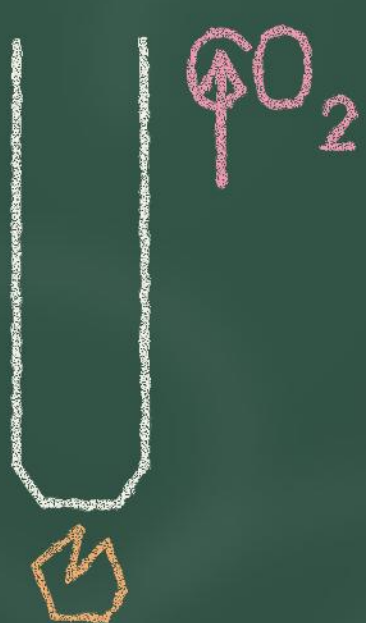
PrayogX · Chemistry

PRAYOGX

Losing CO_2: Decarboxylation

$$\underset{2\,C}{CH_3COONa} \xrightarrow[\text{heat}]{\text{soda lime}} \underset{1\,C}{CH_4}$$



where did 1 C go?

decarboxylation

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Losing CO_2: Decarboxylation

soda lime = NaOH + CaO

(3 : 1)

$$RCOONa + NaOH \xrightarrow[\text{heat}]{CaO} R\text{-}H + Na_2CO_3$$

alkane: one carbon less

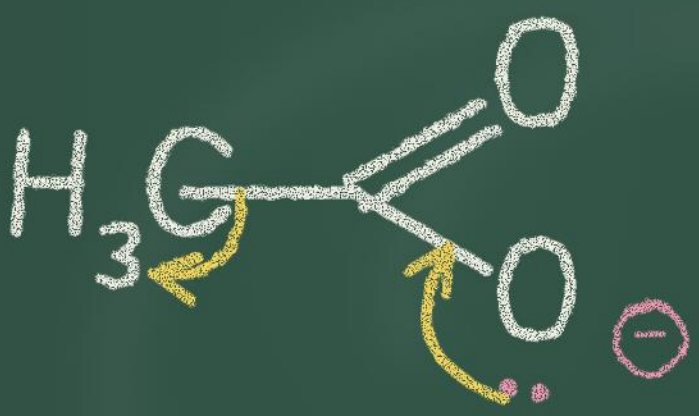
the CO_2 ends up in Na_2CO_3

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Losing CO_2: Decarboxylation

a simple picture



$H_3C^{\ominus}$

carbanion

+ H

CH_4

methane

O=C=O

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Losing CO_2: Decarboxylation

Kolbe electrolysis



$$CH_3COO^- - e^- \rightarrow CH_3COO\cdot$$

$$CH_3COO\cdot \rightarrow CH_3\cdot + CO_2$$

$$CH_3\cdot + \cdot CH_3 \rightarrow CH_3\text{-}CH_3$$

ethane

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Losing CO_2: Decarboxylation

soda lime:

$CH_3COONa \rightarrow CH_4$

$2\,C \rightarrow 1\,C \;(-1\,C)$

Kolbe:

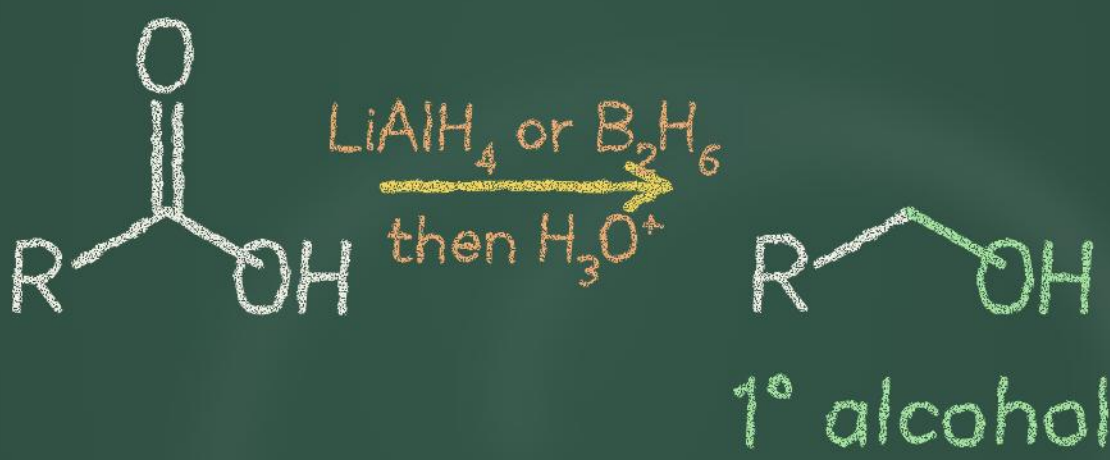
$2\,CH_3COO^- \rightarrow C_2H_6$

R + R: the chain doubles

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Losing CO_2: Decarboxylation



$$RCOOH \rightarrow RCH_2OH$$

$NaBH_4$: no reaction with COOH

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PRAYOGX

Losing CO_2: Decarboxylation

remember

soda lime, heat → alkane, 1 C less

Kolbe electrolysis → alkane R–R

$LiAlH_4$ → 1° alcohol

next: a halogen next to COOH