



STARTER FOR 10...

9. Organic Synthesis

9.1 Organic transformations 1

9.2 Organic transformations 2

9.3 Organic transformations 3

Answers

Further synthesis problems can be found in each organic chemistry chapter.



STARTER FOR 10...

9.1. Organic Transformations 1

Complete the diagram showing the reagents, conditions and mechanisms that accompany the following transformations.

	Reagents	Conditions	Mechanism
$\text{CH}_3\text{CH}_2\text{OH} \longrightarrow \text{CH}_3\text{CHO}$	<input type="text"/>	<input type="text"/>	<input type="text" value="x"/>
$\text{CH}_3\text{CH}_2\text{OH} \longrightarrow \text{CH}_3\text{CO}_2\text{H}$	<input type="text"/>	<input type="text"/>	<input type="text" value="x"/>
$\text{CH}_3\text{CH}_2\text{Br} \longrightarrow \text{CH}_3\text{CH}_2\text{CN}$	<input type="text"/>	<input type="text" value="x"/>	<input type="text"/>
$\text{CH}_3\text{CO}_2\text{H} \longrightarrow \text{CH}_3\text{CONH}_2$	<input type="text"/>	<input type="text" value="x"/>	<input type="text" value="x"/>
$\text{CH}_3\text{CN} \longrightarrow \text{CH}_3\text{CH}_2\text{NH}_2$	<input type="text"/>	<input type="text"/>	<input type="text"/>



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9.2. Organic Transformations 2

Complete the diagram showing the reagents, conditions and mechanisms that accompany the following transformations.

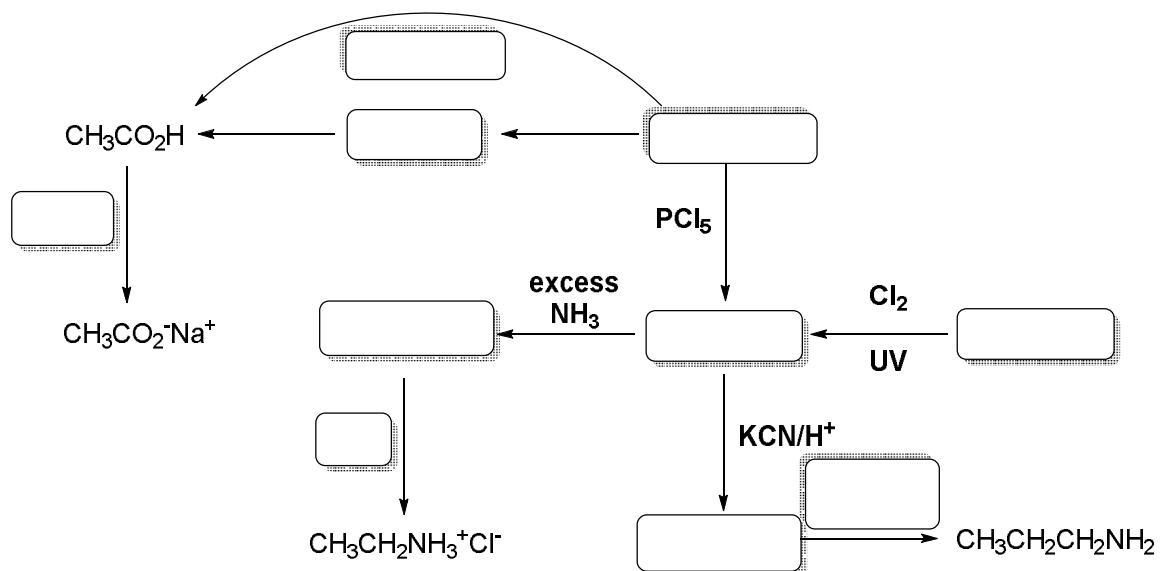
	Reagents	Conditions	Mechanism
$\text{CH}_3\text{CONH}_2 \longrightarrow \text{CH}_3\text{CH}_2\text{NH}_2$	<input type="text"/>	x	<input type="text"/>
$\text{CH}_3\text{CH}_3 \longrightarrow \text{CH}_3\text{CH}_2\text{Cl}$	<input type="text"/>	<input type="text"/>	<input type="text"/>
$\text{CH}_3\text{CH}_2\text{Br} \longrightarrow \text{CH}_3\text{CH}_2\text{NH}_2$	<input type="text"/>	<input type="text"/>	<input type="text"/>
$\text{H}_2\text{C}=\text{CH}_2 \longrightarrow \text{CH}_3\text{CH}_2\text{Br}$	<input type="text"/>	x	<input type="text"/>



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9.3. Organic Transformations 3

Complete the diagram below to show the reagents and species formed.





STARTER FOR 10...

9. Answers

Answers

9.1 Organic transformations 1

	Reagents	Conditions	Mechanism
$\text{CH}_3\text{CH}_2\text{OH} \longrightarrow \text{CH}_3\text{CHO}$	$\text{K}_2\text{Cr}_2\text{O}_7/\text{H}^+$	Distillation	x
$\text{CH}_3\text{CH}_2\text{OH} \longrightarrow \text{CH}_3\text{CO}_2\text{H}$	$\text{K}_2\text{Cr}_2\text{O}_7/\text{H}^+$	Reflux	x
$\text{CH}_3\text{CH}_2\text{Br} \longrightarrow \text{CH}_3\text{CH}_2\text{CN}$	KCN	x	Nucleophilic sub ⁿ
$\text{CH}_3\text{CO}_2\text{H} \longrightarrow \text{CH}_3\text{CONH}_2$	NH_3	x	x
$\text{CH}_3\text{CN} \longrightarrow \text{CH}_3\text{CH}_2\text{NH}_2$	LiAlH_4	Dry ether solvent	Nucleophilic add ⁿ

9.2 Organic transformations 2

	Reagents	Conditions	Mechanism
$\text{CH}_3\text{CONH}_2 \longrightarrow \text{CH}_3\text{CH}_2\text{NH}_2$	H_2/Ni or LiAlH_4	x	Nucleophilic add ⁿ
$\text{CH}_3\text{CH}_3 \longrightarrow \text{CH}_3\text{CH}_2\text{Cl}$	Cl_2	UV light	Free radical substitution
$\text{CH}_3\text{CH}_2\text{Br} \longrightarrow \text{CH}_3\text{CH}_2\text{NH}_2$	NH_3	Excess	Nucleophilic substitution
$\text{H}_2\text{C}=\text{CH}_2 \longrightarrow \text{CH}_3\text{CH}_2\text{Br}$	HBr	x	Electrophilic addition

9.3 Organic transformations 3

