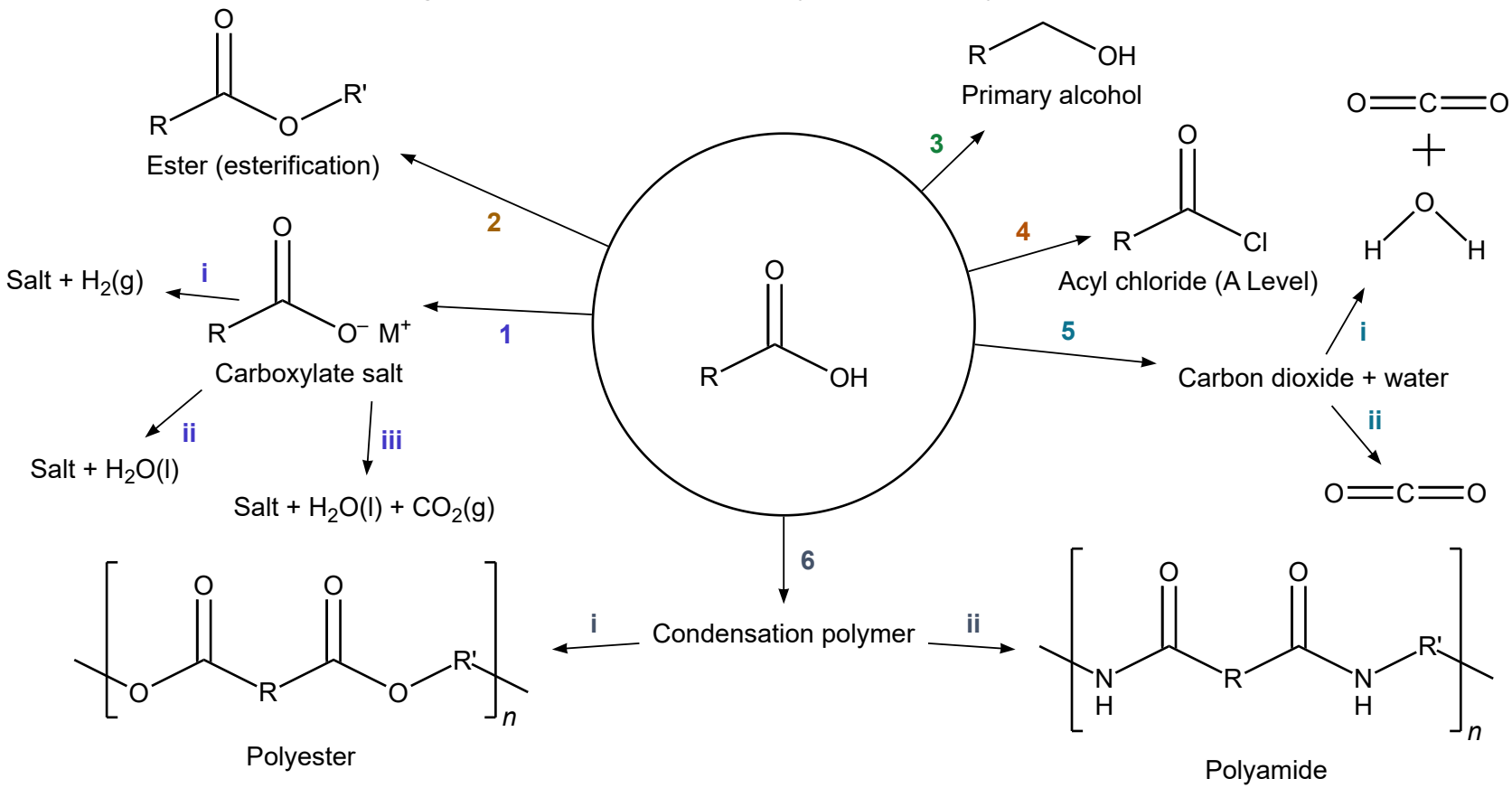
Carboxylic Acids Map

Cambridge International AS & A Level Chemistry · Topic 18 Carboxylic acids and derivatives



1 acid-base: reactive metals, alkalis or carbonates, room temperature
i reactive metal (redox)
ii alkali (neutralisation)
iii carbonate, effervescence

2 condensation (esterification): alcohol, R'OH, conc. H_2SO_4 catalyst, heat

3 reduction: [H]; $LiAlH_4$, dry ether

4 substitution: PCl_3 and heat, PCl_5, or $SOCl_2$
i PCl_3, heat
ii PCl_5, room temperature
iii $SOCl_2$, room temperature

5 oxidation: [O] (A Level: HCOOH and $(COOH)_2$ only)
i methanoic acid: Fehling's, Tollens', acidified $KMnO_4$ or acidified $K_2Cr_2O_7$, warm
ii ethanedioic acid: acidified $KMnO_4$, warm

6 polymerisation (condensation): diol or diamine (A Level: from dicarboxylic acids)
i diol
ii diamine

Acidity: carboxylic acids > phenols > alcohols; Cl atoms near –COOH increase acidity.
Made by oxidising 1° alcohols or aldehydes (reflux), or by hydrolysing nitriles or esters.

acid-base condensation reduction substitution oxidation polymerisation

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