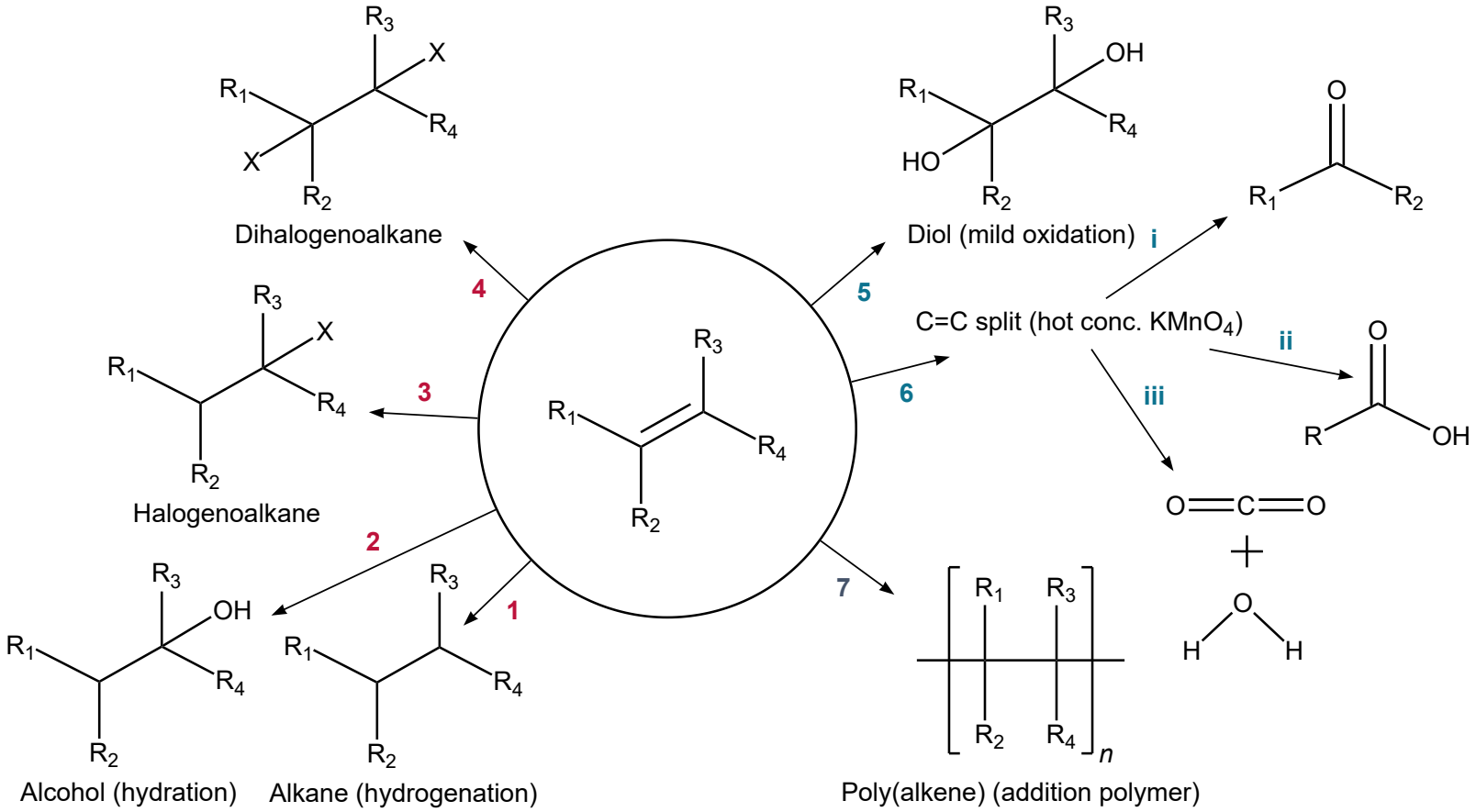
Alkenes Map

Cambridge International AS & A Level Chemistry · Topic 14 Hydrocarbons



1 addition: $H_2(g)$, Pt or Ni catalyst, heat

2 addition: steam, $H_2O(g)$, H_3PO_4 catalyst

3 addition: HX(g), room temperature; Markovnikov product

4 addition: X_2 (Cl_2, Br_2), room temperature; aqueous bromine orange → colourless

5 oxidation: [O]; cold dilute acidified $KMnO_4$, room temperature; purple → colourless

6 oxidation: [O]; hot concentrated acidified $KMnO_4$, heat; the C=C bond breaks
i from $R_2C=$ ends → ketone
ii from RCH= ends → carboxylic acid
iii from $CH_2=$ ends → carbon dioxide + water

7 polymerisation: ethene, propene or chloroethene, high pressure and heat with an initiator, or a catalyst

Test for C=C: aqueous bromine turns from orange to colourless.
Alkyl groups push electrons (inductive effect), so the more substituted carbocation is more stable.
Hot $KMnO_4$ products locate the C=C in a larger molecule.

addition **oxidation** **polymerisation**

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