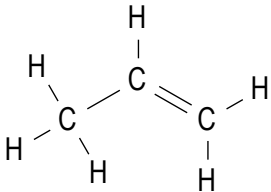
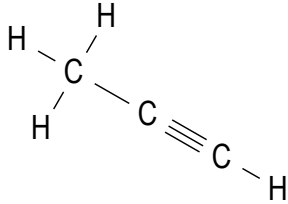
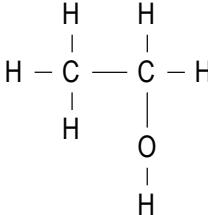
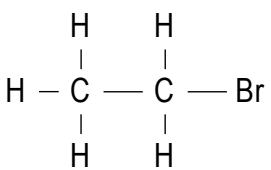
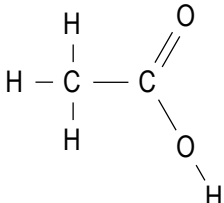
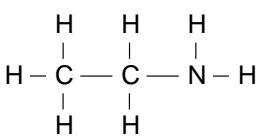
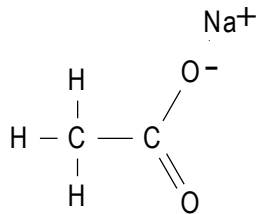
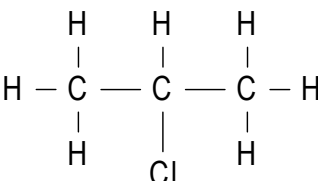
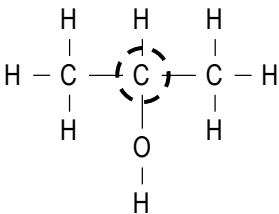
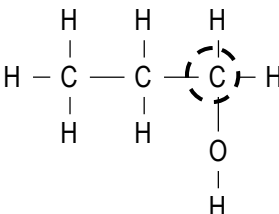
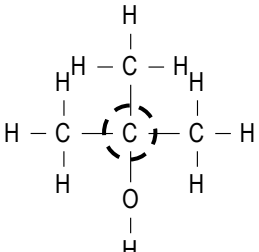
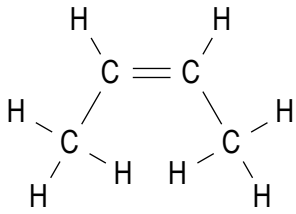
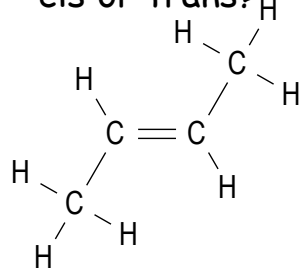
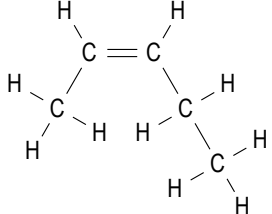
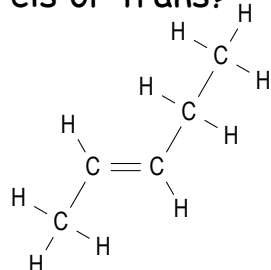
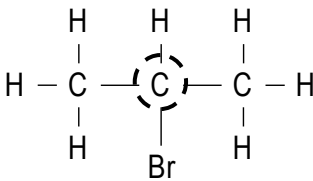
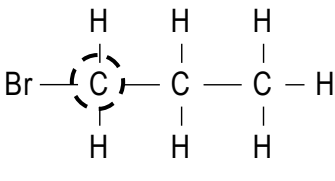
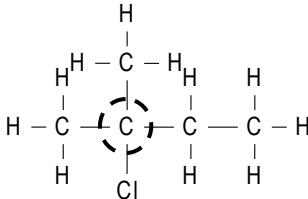



<u>General formula</u>	<u>General formula</u>	<u>General formula</u>	<u>General formula</u>
C_nH_{2n+2}	for alkanes	C_nH_{2n}	for alkenes
alkanes	C_nH_{2n+2}	alkenes	C_nH_{2n}
<u>General formula</u>	<u>General formula</u>	<u>General formula</u>	<u>General formula</u>
C_nH_{2n-2}	for alkynes	$C_nH_{2n+1}OH$	for alcohols
alkynes	C_nH_{2n-2}	alcohols	$C_nH_{2n+1}OH$
<u>Functional group</u>	<u>Functional group</u>	<u>Functional group</u>	<u>Functional group</u>
			
alkene	alkyne	alcohol (1°)	haloalkane (bromoalkane)
<u>Functional group</u>	<u>Functional group</u>	<u>Functional group</u>	<u>Functional group</u>
			
carboxylic acid	amine	sodium salt of carboxylic acid	haloalkane (chloroalkane)

<u>Type of reaction</u> Hydrogenation (with Pt catalyst)	<u>Type of reaction</u> Hydration (H ₂ O/H ⁺)	<u>Type of reaction</u> Substitution (Cl ₂ / Br ₂)	<u>Type of reaction</u> Addition (H ₂ O, H ₂ , Cl ₂ , Br ₂ , HCl, HBr etc)
addition of H ₂	addition of water	exchange atom for another	add atoms of molecule across double bond
<u>Type of reaction</u> Polymerisation is process where ____ join to form a _____	<u>Type of reaction</u> dehydration	<u>Type of reaction</u> between amine + HCl	<u>Type of reaction</u> between carboxylic acid + NaOH
monomers polymer	removal of water	acid-base or neutralisation	acid-base or neutralisation
<u>Type of reaction</u> Elimination (from an alcohol)	<u>Type of reaction</u> Dehydration (of an alcohol) - also an elimination reaction	orange Br ₂ water is rapidly decolourised by [1] but slowly by [2] (needs UV light)	Purple acidified MnO ₄ ⁻ is decolourised if it is shaken with an [1] but NOT with an [2]
alcohol → alkene	alcohol → alkene	[1] alkenes [2] alkanes	[1] alkene [2] alkane
<u>Type of formula</u> $ \begin{array}{ccccc} & \text{H} & & \text{H} & & \text{H} \\ & & & & & \\ \text{H} & - \text{C} & - & \text{C} & - & \text{C} & - \text{H} \\ & & & & & \\ & \text{H} & & \text{O} & & \text{H} \\ & & & & & \\ & & & \text{H} & & \end{array} $	<u>Type of formula</u> CH ₃ CH(OH)CH ₃	<u>Halogenation</u> of an alkane, eg C ₆ H ₁₄ + Br ₂ needs ____ and/or ____ to occur	<u>Halogenation</u> eg C ₆ H ₁₄ + Br ₂ (in UV light) produces
structural - expanded	structural - condensed	UV light / heat	C ₆ H ₁₃ Br + HBr (monosubstituted)

IUPAC naming $\text{CH}_3\text{-}$ $\text{C}_2\text{H}_5\text{-}$ $\text{C}_3\text{H}_7\text{-}$	IUPAC naming $\text{C}_4\text{H}_9\text{-}$ $\text{C}_5\text{H}_{11}\text{-}$ $\text{C}_6\text{H}_{13}\text{-}$	Addition of HX or H_2O (H-OH) to asymmetric alkene: H adds to carbon that has most H's already	Useful saying to remember Markovnikov's rule for addition of $\text{HX}/\text{H}_2\text{O}$ to an asymmetric alkene
methyl, ethyl, propyl	butyl, pentyl, hexyl	Markovnikov's rule	"the rich get richer"
Reaction of $\text{H}^+/\text{MnO}_4^-$ with alkenes Observation...	Reaction of $\text{H}^+/\text{MnO}_4^-$ with alkenes Product...	<u>Polymerisation</u> $n(\text{C}_2\text{H}_4)$ polymerises to form	<u>Polymerisation</u> $n(\text{C}_3\text{H}_6)$ polymerises to form
purple colour is decolourised	a diol eg $\text{CH}_2(\text{OH})\text{CH}_2\text{OH}$	$-(\text{C}_2\text{H}_4)\text{-}_n$ polyethene	$-(\text{C}_3\text{H}_6)\text{-}_n$ polypropene
$\text{H} - \text{C} \equiv \text{C} - \text{H}$ name molecular formula family	<u>Class of alcohol</u> 	<u>Class of alcohol</u> 	<u>Class of alcohol</u> 
ethyne, C_2H_2, alkyne	secondary	primary	tertiary
<u>Reagent & conditions</u> To oxidise a primary alcohol to a carboxylic acid	<u>Reagent & conditions</u> To eliminate H_2O from an alcohol	<u>Reagent & conditions</u> To hydrate an alkene (turn alkene to alcohol)	<u>Reagent & conditions</u> To make an amine from a haloalkane
heat with $\text{H}^+/\text{Cr}_2\text{O}_7^{2-}$ or $\text{H}^+/\text{MnO}_4^-$	heat with conc. H_2SO_4	$\text{H}^+/\text{H}_2\text{O}$	conc. NH_3 (alc)

Useful saying to remember Saytzeff's rule for removal of HX / H ₂ O from R-OH or R-Cl	Removal of HX from an asymmetric haloalkane: H lost from carbon that has least H...	Removal of H ₂ O from an asymmetric alcohol: H lost from carbon that has least H...	Organic compounds often with a fishy smell that turn red litmus blue
"the poor get poorer"	Saytzeff's rule	Saytzeff's rule	amines
C-C single bond remains a C-C single bonds but an atom or group of atoms is replaced by another atom or group of atoms	C-C single bond becomes a C=C double bonds & two atoms or small groups are removed from a molecule	C=C double bond forms a C-C single bond in its place as well as forming two new single bonds	<u>Reagent & conditions</u> To convert R-OH into R-Cl
substitution reaction	elimination reaction	addition reaction	Use PCl ₃ , PCl ₅ or SOCl ₂
Reaction of CH ₃ COOH with a reactive metal like Mg	Reaction of CH ₃ COOH with sodium carbonate Na ₂ CO ₃	Reactions of carboxylic acids with UI paper or litmus	Reactions of carboxylic acids With NaOH or Na ₂ CO ₃ or NaHCO ₃ are...
(CH ₃ COO) ₂ Mg + H ₂ gas	CH ₃ COONa + H ₂ O + CO ₂ gas	UI turns orange, blue litmus turns red: due to H ⁺	acid-base reactions
cis or trans? 	cis or trans? 	cis or trans? 	cis or trans? 
cis-but-2-ene	trans-but-2-ene	cis-pent-2-ene	trans-pent-2-ene

Removal of H ₂ O from R-OH or HCl from R-Cl produces	Same molecular formula, different arrangement of atoms eg C ₃ H ₇ OH as 1° & 2° alcohol	_____ isomers have the same molecular formula but differ in sequence in the atoms are joined	_____ isomers can occur in molecules with double bonds, because rotation of the atoms in the carbon - carbon double bond is restricted.
an alkene	structural isomers	structural	geometrical / cis-trans
<u>Classification of haloalkane</u> 	<u>Classification of haloalkane</u> 	<u>Classification of haloalkane</u> 	Cis-trans isomers must have _____ different groups attached to each of the carbons in the double bond.
secondary	primary	tertiary	two
<u>Reagent & conditions</u> To convert R-Cl into R-OH (substitution)	<u>Reagent & conditions</u> To convert R-Cl into an alkene (elimination)	<u>Reagents</u> PCl ₃ , PCl ₅ and SOCl ₂ can be used to convert _____ to _____	
heat with KOH(aq) or NaOH(aq)	heat with KOH(alc) or NaOH(alc)	Alcohol to haloalkane	
			 No Brain Too Small ● CHEMISTRY 