

VIDEO SUMMARIES: ORGANIC

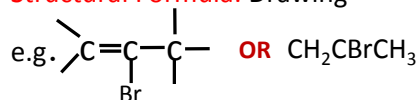
NAMING COMPOUNDS – PART 1

What you need to know:

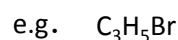
No of Carbons	Prefix
1	meth
2	eth
3	prop
4	but
5	pent
6	hex
7	hept
8	oct

Alkanes - ane	—C—C—
Alkene - ene	—C=C—
Alkynes - yne	—C≡C—
Haloalkanes - o-	—C—(Cl, Br)
Alcohols - anol	—C—OH
Carboxylic Acids - anoic acid	—COOH
Amine - amide	—C—NH ₂

Structural Formula: Drawing



Molecular Formula: number of each atoms



Name: includes the position (no#)



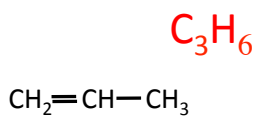
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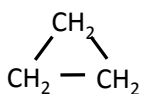
NAMING COMPOUNDS – PART 2

What you need to know:

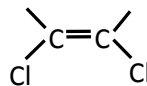
1. Isomers are compounds that have the same atoms, but different arrangements
2. There are two types of isomers:
 - i. Structural isomers – same molecular formula, different structural formula
 - ii. Geometric isomers – cis (same side), trans (opposite side)



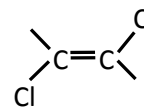
propene



cyclopropane



cis 1,2 dichloroethene



trans 1,2 dichloroethene

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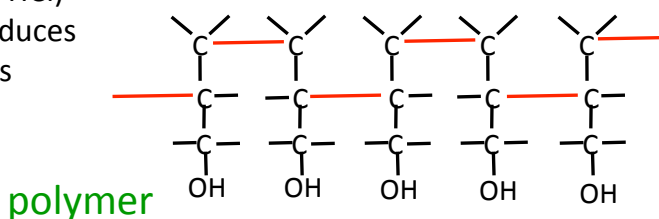


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ADDITION REACTIONS

What you need to know:

1. Addition is breaking a double bond (fast)
2. Alkenes:
 - i. Hydration (H_2O) \rightarrow alcohol
 - i. Hydrogenation (H_2/Pt) \rightarrow alkane
 - ii. Halogenation ($\text{Br}_2, \text{Cl}_2, \text{HCl}, \text{HBr}$) \rightarrow haloalkane
 - iii. Markovnikov's Rule (HBr, HCl)
(the rich get richer) – produces major and minor products
 - iv. Polymerisation



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SUBSTITUTION REACTIONS

What you need to know:

Substitution is replacing one atom with another
This takes time and energy (heat or light)

Alkanes \rightarrow Haloalkanes	Occurs with Br_2 or Cl_2
Alcohols \rightarrow Haloalkanes	Occurs with $\text{PCl}_3, \text{PCl}_5$ or SOCl_2
Haloalkanes \rightarrow Amides	Occurs with conc NH_3
Haloalkanes \rightarrow Alcohol	Aqueous KOH
Carboxylic Acid + base \rightarrow Salt	Occurs with NaHCO_3 Makes fizzing CO_2

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ELIMINATION REACTIONS

What you need to know:

- Concentrated H_2SO_4 is the reagent used for elimination reactions
- Alcohol \rightarrow Alkene (H_2O produced)
- Haloalkane \rightarrow Alkene (hydrogen halide – HCl, HBr – produced)

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OXIDATION REACTIONS

What you need to know:

$\text{Cr}_2\text{O}_7^{2-}$
dichromate
orange to green

MnO_4^-
permanganate
purple to colourless

Alcohols

Primary	OH is attached to a C that is attached to one other carbon	Oxidised to an aldehyde	
		Aldehyde is oxidised to a carboxylic acid	
Secondary	OH is attached to a C that is attached to two other carbons	Oxidised to a ketone	
Tertiary	OH is attached to a C that is attached to three other carbons	Not oxidised	
Alkane		Oxidised to alcohol	$-\text{C}-\text{H} \rightarrow -\text{C}-\text{OH}$

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REACTION SCHEMES

Addition

- Alkene → Alcohol (Hydration) $\text{H}_2\text{O}/\text{H}^+$
- Alkene → Alkane (Hydrogenation) H_2/Pt
- Alkene → Haloalkane (Halogenation) $\text{Br}_2, \text{Cl}_2, \text{HCl}, \text{HBr}$
- Polymerisation

Substitution

- Alkane → Haloalkane Br_2/Cl_2
- Alcohols → Haloalkane $\text{PCl}_3, \text{PCl}_5, \text{SOCl}_2$
- Haloalkane → Amides $\text{NH}_3 \text{ conc}$
- Haloalkane → Alcohol KOH aqueous
- Carboxylic acid → Salt NaHCO_2

Elimination

- Alcohol → Alkene $\text{conc H}_2\text{SO}_4$
- Haloalkane → Alkene

Oxidation

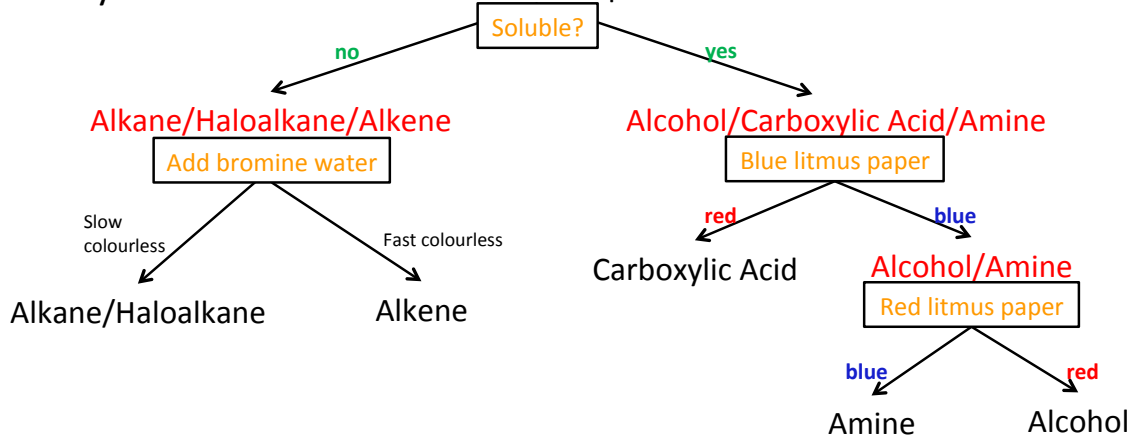
- MnO_4^- $\text{Cr}_2\text{O}_7^{2-}$
- 1° Alcohol → Aldehyde → Carboxylic Acid
- 2° Alcohols → Ketone
- Alkane → Alcohol

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IDENTIFYING ORGANIC COMPOUNDS

What you need to know: Colourless Liquid



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