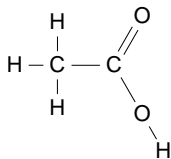
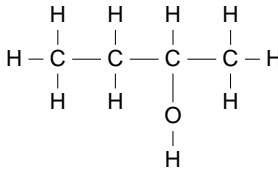
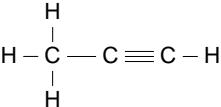
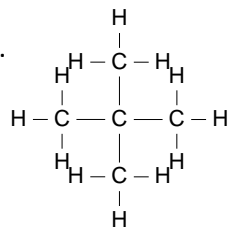
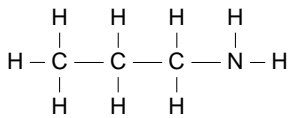
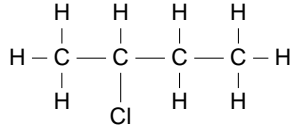
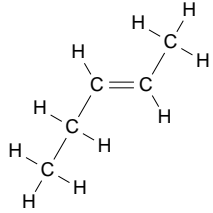


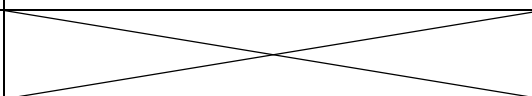
AS 91165

Demonstrate UNDERSTANDING of selected organic compounds

REVISION QUESTIONS – TEST YOURSELF

Match A-H with their organic family & name each molecule

<p>A.</p> 	<p>B.</p> 	<p>C.</p> 	<p>D.</p> 
<p>E.</p> 	<p>F.</p> 	<p>G.</p> 	<p>H. CH₃COO⁻Na⁺</p>

alkane – <i>D, methyl propane</i>	alkene (and is it cis- or trans-?)	alkyne
haloalkane	alcohol	carboxylic acid
amine	sodium salt of carboxylic acid	

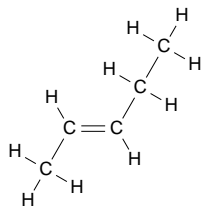
What does each of these reagents do?

- | | |
|--|--|
| A. Br ₂ | F. PCl ₃ , PCl ₅ , or SOCl ₂ or HCl |
| B. H ⁺ /H ₂ O, heat | G. Conc. H ₂ SO ₄ , heat |
| C. H ⁺ /MnO ₄ ⁻ | H. Br ₂ with <i>uv</i> light and/or heat |
| D. H ⁺ /Cr ₂ O ₇ ²⁻ , heat | I. Conc. NH ₃ |
| E. KOH(aq), heat | J. KOH(alc), heat |

<input type="checkbox"/> When added to an alkene or alkyne it is decolourised rapidly; solution turns from orange to colourless (addition)	<input type="checkbox"/> When added to an alkane it is decolourised slowly; solution turns from orange to colourless (substitution)	<input type="checkbox"/> When added to an alkene, a diol is formed; solution turns from purple to colourless (oxidation)	<input type="checkbox"/> Will convert an alcohol into an amine (substitution)	<input type="checkbox"/> Used to convert a primary alcohol to a carboxylic acid; solution turns from orange to green (oxidation)
<input type="checkbox"/> Will convert an alkene into an alcohol (addition)	<input type="checkbox"/> Will convert a haloalkane into an alcohol (substitution)	<input type="checkbox"/> Will convert an alcohol into an haloalkane (substitution)	<input type="checkbox"/> Will convert a haloalkane into an alcohol (substitution)	<input type="checkbox"/> Will convert an alcohol into an alkene (elimination)

Cis and trans isomerism

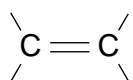
Requires a C=C bond because this does NOT allow free rotation. Requires each C of the C=C to have 2 different atoms or groups.



Draw the cis form of

Draw the cis and trans forms of but-2-ene.

You should use this



format to show the cis/trans.

Identifying stuff!

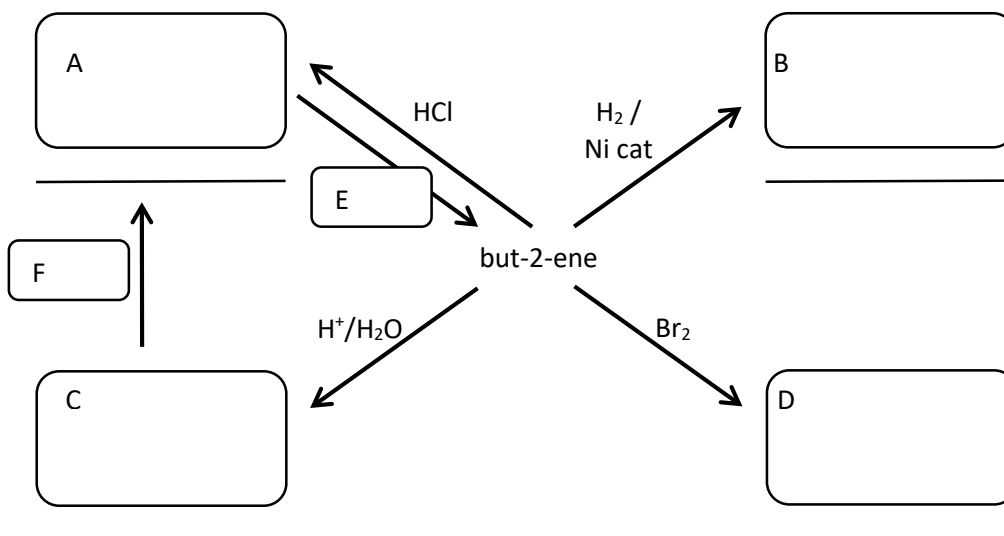
You are given five liquids which you know to be the solutions listed below.

Using only 1) blue and red litmus paper, 2) acidified potassium dichromate solution, and 3) bromine water, discuss how you would systematically identify the four unknown solutions. Give equations where appropriate.

octene propanoic acid butan-1-ol octane aminoethane

Reactions of alkenes

Alkenes such as but-2-ene are used by the petrochemical industry to produce many useful materials. Draw structures to represent possible compounds A-D in the reactions of but-2-ene shown below. Give the names of the compounds formed. Suggest reagents and conditions for conversions E & F

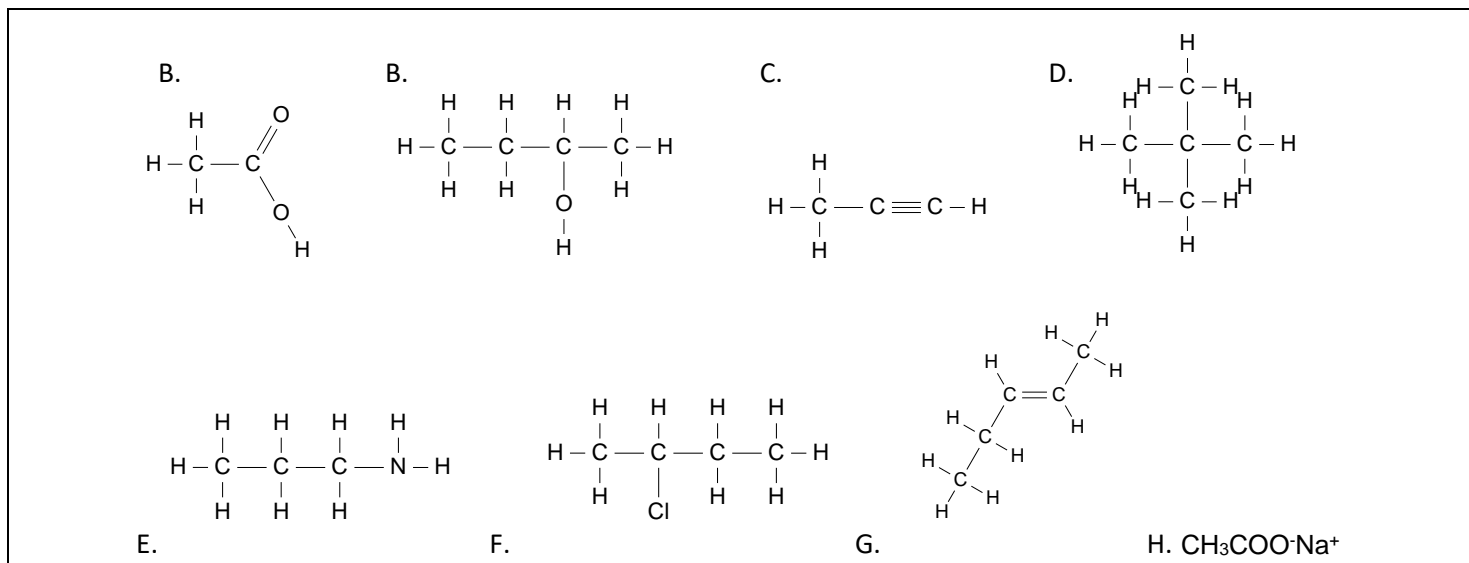


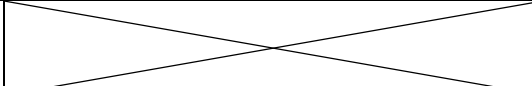
AS 91165

Demonstrate UNDERSTANDING of selected organic compounds

REVISION QUESTIONS – ANSWERS

Match A-H with their organic family & name each molecule



alkane – D, methyl propane	alkene (and is it cis- or trans-?) – G, trans-pent-2-ene	alkyne – C, propyne
haloalkane – F, 2 chlorobutane	alcohol – B, butan-2-ol (or 2-butanol)	carboxylic acid – A, ethanoic acid
amine – E, 1-aminopropane	sodium salt of carboxylic acid – H, sodium ethanoate	

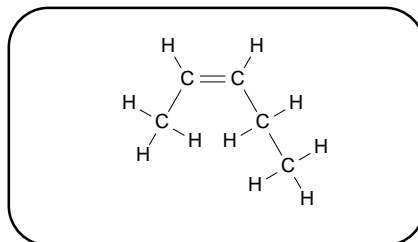
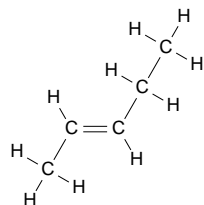
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| D. H ⁺ /Cr ₂ O ₇ ²⁻ , heat | I. Conc. NH ₃ |
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A When added to an alkene or alkyne it is decolourised rapidly; solution turns from orange to colourless (addition)	H When added to an alkane it is decolourised slowly; solution turns from orange to colourless (substitution)	C When added to an alkene, a diol is formed; solution turns from purple to colourless (oxidation)	I Will convert an alcohol into an amine (substitution)	D Used to convert a primary alcohol to a carboxylic acid; solution turns from orange to green (oxidation)
B Will convert an alkene into an alcohol (addition)	J Will convert a haloalkane into an alcohol (substitution)	F Will convert an alcohol into a haloalkane (substitution)	E Will convert a haloalkane into an alcohol (substitution)	G Will convert an alcohol into an alkene (elimination)

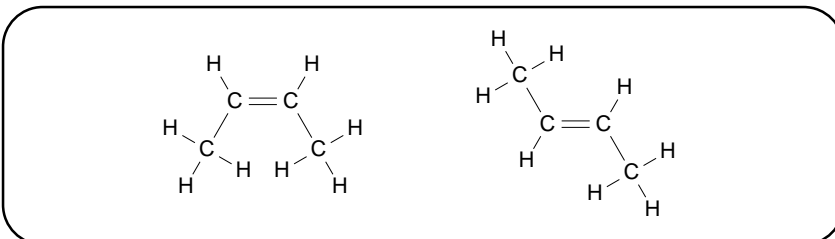
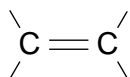
Cis and trans isomerism

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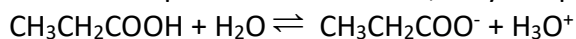
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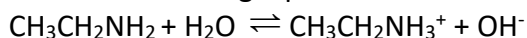
octene propanoic acid butan-1-ol octane aminoethane

(Order may vary – this is one possible sequence).

Test each liquid with blue litmus; only the propanoic acid will turn it red as it is a weak acid.



Test the remaining liquids with red litmus; only the aminoethane will turn it blue as it is a weak base.



Warm the remaining three with $\text{H}^+/\text{Cr}_2\text{O}_7^{2-}$; only the butan-1-ol will be oxidised to butanoic acid, and the

orange dichromate will change from orange to the green Cr^{3+} ion. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH} \rightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$

Add Br_2 water to the remaining two – both will be insoluble in the aqueous bromine water forming two layers

BUT the alkene (octene) will decolourise the bromine water rapidly (orange to colourless) and the alkane (octane) will only decolourise it slowly (in the presence of uv light and/or heat).



Reactions of alkenes

- A. 2-chlorobutane
- B. butane
- C. butan-2-ol (2-butanol)
- D. 2,3-dibromobutane
- E. KOH (alc)/ heat
- F. SOCl₂ (or PCl₃ or PCl₅)

