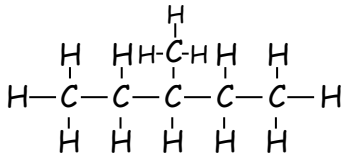
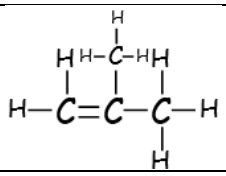
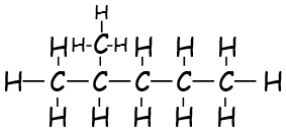
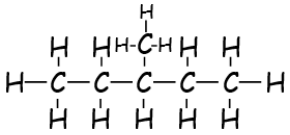
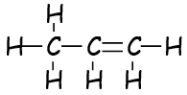
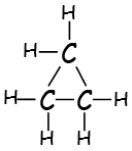
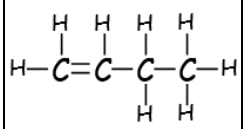
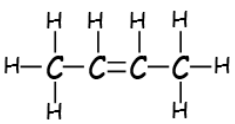
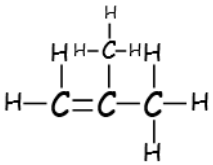
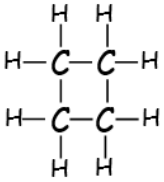
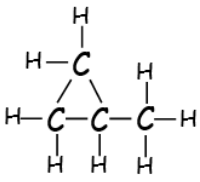
National 5 Chemistry
Unit 2.1a Naming and Drawing Hydrocarbons

JAB chem

		Lesson	Traffic Light Red	Amber	Green
1	A homologous series is a family of compounds with • same general formula • similar chemical properties.		☹	😐	☺
2	Patterns are often seen in the physical properties of the members of a homologous series. • Physical properties include melting points, boiling points, solubility Melting & boiling points increase as the size of molecule increases for any homologous series • These changes in physical properties are due the strength of the intermolecular forces between the molecules. • As size of molecule increases, the strength of the intermolecular forces increases		☹	😐	☺
3	Hydrocarbons are compounds containing only hydrogen and carbon atoms • alkanes, alkenes and cycloalkanes are examples of homologous series		☹	😐	☺
4	Compounds containing only carbon–carbon single bonds are described as saturated. • Alkanes and cycloalkanes are saturated hydrocarbons Compounds containing at least one carbon–carbon double bond are described as unsaturated. • Alkenes are unsaturated hydrocarbons		☹	😐	☺
5	It is possible to distinguish an unsaturated compound from a saturated compound using bromine solution. • Unsaturated compounds decolourise bromine solution quickly e.g. alkenes • Saturated compounds do not decolourise bromine solution quickly e.g. alkanes and cycloalkanes		☹	😐	☺
6a	The structure of any molecule can be drawn as a full or a shortened structural formula. Full Structural Formula:   Shortened Structural Formula: $CH_3CH_2CH(CH_3)CH_2CH_3$ $CH_2{=}C(CH_3)CH_3$		☹	😐	☺
6b	Isomers are compounds with: • same molecular formula but different structural formulae  2-methylpentane C_6H_{14}  3-methylpentane C_6H_{14} • may belong to different homologous series e.g. alkenes and cycloalkanes  propene C_3H_6  cyclopropane C_3H_6 • usually have different physical properties e.g. alkenes decolourise bromine solution		☹	😐	☺
7	Given a structural formula for a compound, an isomer can be drawn. Isomers can be drawn for a given molecular formula.		☹	😐	☺

C_4H_8	C_4H_8	C_4H_8	C_4H_8	C_4H_8
				
but-1-ene	but-2-ene	2-methylpropene	cyclobutane	methylcyclopropane

Nat5
Traffic Lights

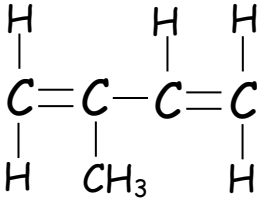
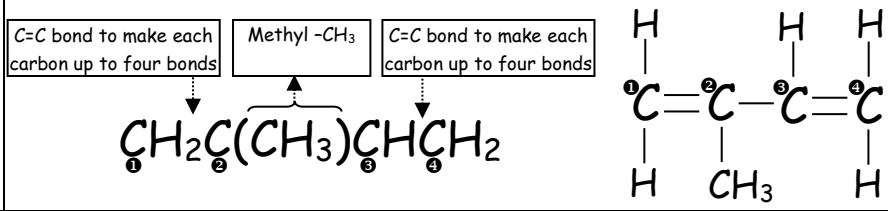
Past Paper Question Bank

Unit 2.1a Naming and Drawing Hydrocarbons

JABchem

Outcome	Original Specimen Paper	New Specimen Paper	Nat5 2014	Nat5 2015	Nat5 2016	Nat5 2017	Nat5 2018	Nat5 2019	Nat5 2020	Nat5 2021						
1	L7a	mc15 L7a	L9a			L9a	L16a(i)	L7a								
2			L9b					L5c(ii)								
3							L4a									
4							L9a(i)									
5	mc13			L3b(ii)		mc11	L9a(ii)	L5a								
6a		L10a			L8a		mc10									
6b		mc13		L12b		L9b		mc13								
7	mc12		L8b(ii)		mc12		mc11									

Nat5	Answer	% Correct	Reasoning
2016 MC 12	B	61	☒A but-1-ene shown is exact same structure as right isomer at top of question ☑B same formula (C_4H_8) but different structure (methylpropene) ☒C cyclobutene C_4H_6 has a different formula from butene C_4H_8 ☒D pent-1,4-diene C_5H_8 has a different formula to butene C_4H_8
2017 MC 11	D	83	☒A X is an alkene ∴ has C=C double bond ∴ will decolourise bromine solution quickly ☒B Y is a cycloalkane ∴ no C=C double bond ∴ does not decolourise bromine solution ☒C Y is a cycloalkane ∴ no C=C double bond ∴ does not decolourise bromine solution ☑D X (alkene) will decolourise bromine and Y (cycloalkane) will not decolourise
2018 MC 10	D	-	C_9H_{20} structure drawn is the isomer 3,4-dimethylheptane ☒A C_9H_{20} structure is 2,4-dimethylheptane ∴ different isomer not same structure ☒B C_8H_{18} structure is 3,4-dimethylhexane ∴ different formula not same structure ☒C C_9H_{20} structure is 3,3-dimethylheptane ∴ different isomer not same structure ☑D C_9H_{20} structure is 3,4-dimethylheptane ∴ same formula and same structure
2018 MC 11	C	-	C_6H_{14} structure drawn is 2-methylpentane ☒A Cyclohexane C_6H_{12} has different formula so cannot be an isomer of C_6H_{14}. ☒B 2-methylpentane again but drawn different so cannot be an isomer. ☑C 3-methylpentane C_6H_{14} so same formula but different structure so is an isomer. ☒D 2-methylbutane C_5H_{12} has different formula so cannot be an isomer of C_6H_{14}.
2019 MC 13	D	-	☒A Cyclopropane C_3H_6 has an isomer called propene C_3H_6 ☒B But-1-ene C_4H_8 has isomers including but-2-ene C_4H_8 ☒C Pentane C_5H_{12} has isomers including 2-methylbutane C_5H_{12}. ☑D Ethene C_2H_4 has no isomers

<table>
<tr><th>Nat5</th><th>Answer</th><th>Reasoning</th></tr>
<tr><td>2014
8b(ii)</td><td>Any structure from:</td><td>Correct $C_5H_{11}OH$ diagram of:
<table>
<tr><td>pentan-1-ol</td><td>pentan-2-ol</td><td>pentan-3-ol</td></tr>
<tr><td colspan="2">2-methylbutan-1-ol</td><td>2,2-dimethylpropan-1-ol</td></tr>
<tr><td colspan="2">2-methylbutan-2-ol</td><td>3-methylbutan-2-ol</td></tr>
</table>
NB: diagram must be different from 3-methylbutan-1-ol in question and not a redrawing of same 3-methylbutan-1-ol structure.</td></tr>
<tr><td>2014
9a</td><td>
<table>
<tr><td>✓</td></tr>
<tr><td></td></tr>
<tr><td>✓</td></tr>
<tr><td></td></tr>
<tr><td></td></tr>
</table>
</td><td>
<table>
<tr><td>They have similar chemical properties</td><td>✓</td><td>Propane and butane are both members of the alkane family and have the same chemical properties.</td></tr>
<tr><td>They have the same molecular formula</td><td></td><td>Propane is C_3H_8 and Butane is C_4H_{10}</td></tr>
<tr><td>The have the same general formula</td><td>✓</td><td>All alkanes have the general formula C_nH_{2n+2}</td></tr>
<tr><td>They have the same physical properties</td><td></td><td>Alkanes have gradually changing physical properties
e.g. bpt of propane = -42°C and bpt of butane = -1°C</td></tr>
<tr><td>The have the same formula mass</td><td></td><td>gfm propane C_3H_8 = 44g
gfm butane C_4H_{10} = 58g</td></tr>
</table>
</td></tr>
<tr><td>2014
9b</td><td>Answer to include:</td><td>Butane C_4H_{10} has more carbons than propane C_3H_8.
The larger the molecules the higher the boiling point.</td></tr>
<tr><td>2015
3b(ii)</td><td>Bromine decolourises</td><td>Bromine solution is an yellow/orange colour contains molecules of Br_2.
The solution will decolourise as the bromine adds across the double bond.
Only C=C double bonds will decolourise bromine solution.</td></tr>
<tr><td>2015
12b</td><td>Same formula but different structure</td><td>Isomer: same chemical formula but different structural fromula.
Both structures have the formula C_4H_8 but belong do different homologous series. Structure A is a alkene with a C=C double bond and Structure B is a cycloalkane with a ring of carbons.</td></tr>
<tr><td>2016
8a</td><td>  </td><td> 
</td></tr>
<tr><td>2017
9a</td><td>Same chemical properties
Same general formula</td><td>Homologous series (e.g. alkanes, alkenes, cycloalkanes) have</td></tr>
<tr><td>2017
9b</td><td>isomers</td><td>same molecular formula (formula) different structural formula (structure)</td></tr>
<tr><td>2018
4a</td><td>carbon & hydrogen</td><td>A hydrocarbon is a compound containing the elements carbon and hydrogen only.</td></tr>
<tr><td>2018
9a(i)</td><td>contains
C=C double bond</td><td>Saturated: All bonds between carbons are single bonds and it does not decolourise bromine solution quickly.
Unsaturated: At least one C=C double bond between carbons and will decolourise bromine solution quickly.</td></tr>
<tr><td>2018
9a(ii)</td><td>Bromine solution decolourises</td><td>Bromine Br_2 adds across a C=C double bond by addition reaction. Each bromine joins across where the C=C double bond used to be and leaves a C-C single bond in its place.
Bromine solution is yellow/orange and decolourises (loses its colour) when it adds across the C=C double bond.</td></tr>
<tr><td>2018
16a(i)</td><td>Homologous Series</td><td>Homologous Series are families of compounds that have similar chemical properties and a general formula.</td></tr>
</table>

<table>
<tr><td>2019
5a</td><td>Bromine decolourises</td><td>Bromine adds across C=C double bonds and bromine is decolourised in the process.</td></tr>
<tr><td>2019
5c(ii)</td><td>Answer to include:</td><td><table><tr><td>1 mark:</td><td>Cyclopentene has weaker (forces of attraction)</td></tr><tr><td>1 mark:</td><td>Forces between molecules/intermolecular attractions mentioned</td></tr></table></td></tr>
<tr><td>2019
7a</td><td>Same/similar chemical properties <u>and</u> same general formula.</td><td>Members of the same homologous series have the same/similar properties e.g. all alkenes will decolourise bromine solution quickly.
The general formula must fit all members of the homologous series e.g. all alkanes fit the general formula C_nH_{2n+2} e.g. methane CH_4, ethane C_2H_6, propane C_3H_8.</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

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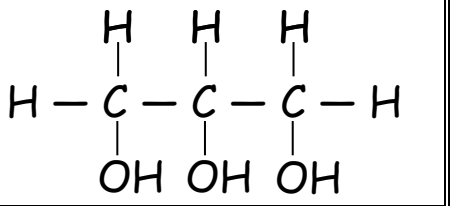
Past Paper Question Bank

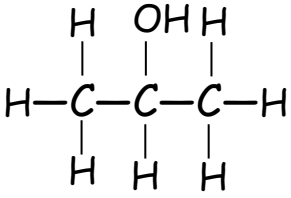
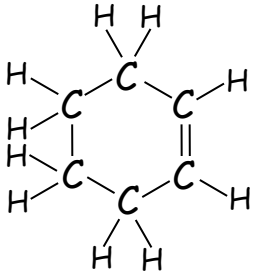
Unit 2.1 Naming and Drawing Hydrocarbons

JABchem

Outcome	Int2 2000	Int2 2001	Int2 2002	Int2 2003	Int2 2004	Int2 2005	Int2 2006	Int2 2007	Int2 2008	Int2 2009	Int2 2010	Int2 2011	Int2 2012	Int2 2013	Int2 2014	Int2 2015
1													L5a			
2														L8b		
3																
4						mc11										
5		L5b(i)		L14a			mc16	L6a				L11c(i)	L8a		L8a(ii)	
6a										mc16						
6b							mc13									
7	L1b	mc11	mc10	mc9	mc16	mc10		mc16	mc15					mc10	L7a(iii)	mc16

Int2	Answer	% Correct	Reasoning
2001 MC 11	B	89	☒A pent-2-ene C_5H_{10} cannot be an isomer of 2,2-dimethylpropane C_5H_{12} ☑B 2-methylbutane C_5H_{12} is an isomer of 2,2-dimethylpropane C_5H_{12} ☒C cyclopentane C_5H_{10} cannot be an isomer of 2,2-dimethylpropane C_5H_{12} ☒D 2,2-dimethylbutane C_6H_{14} cannot be an isomer of 2,2-dimethylpropane C_5H_{12}
2002 MC 10	B	73	☒A Molecule has formula C_6H_{14} and has a different formula from heptane C_7H_{16} ☑B Both molecules have formula C_7H_{16} but are isomers with different structures ☒C Molecule has formula C_7H_{14} and has a different formula from heptane C_7H_{16} ☒D Molecule has formula C_7H_{14} and has a different formula from heptane C_7H_{16}
2003 MC 9	D	67	☒A ethane has only the one structure and has no isomers ☒B ethene has only the one structure and has no isomers ☒C propane has only the one structure and has no isomers ☑D There are two structures for C_3H_6: propene (in question) and cyclopropane
2004 MC 16	B	58	☒A molecule has same structure as molecule 1 so it not an isomer ☑B molecule has same formula C_4H_8 and is an isomer as it has different structure ☒C molecule has formula C_4H_6 so has different formula and is not a formula ☒D molecule has formula C_4H_6 so has different formula and is not a formula
2005 MC 10	C	92	☒A C_5H_{10} molecule cannot be an isomer as it has a different formula to C_5H_{12} ☒B C_5H_{10} molecule cannot be an isomer as it has a different formula to C_5H_{12} ☑C Molecules are isomers as they have same formula but different structures ☒D C_6H_{14} molecule cannot be an isomer as it has a different formula to C_5H_{12}
2005 MC 11	B	66	☒A Molecule shown has C=C double bond so it is unsaturated ☑B Molecule is unsaturated (C=C double bond) and an alcohol (contains –OH group) ☒C Molecule shown has C=C double bond so it is unsaturated ☒D Molecule shown has hydroxyl group so it is an alcohol not a carboxylic acid

2006 MC 13	A	43	☑A Both molecules are the same – Alkane with 5 carbons on main chain ☒B Although the molecules look different, both are alkanes with 5 carbons on main chain ☒C Isomers have same formula and different structures but they are the same ☒D Isotopes have same atomic number but different mass number
2006 MC 16	C	72	☒A Hydrocarbon X is but-1-ene not but-2-ene due to position of C=C double bond ☒B Hydrocarbon X is unsaturated due to presence of C=C double bond ☑C Hydrocarbon X decolourises bromine solution due to C=C double bond ☒D Hydrocarbon X has formula is C_4H_8 so has general formula C_nH_{2n}
2007 MC 16	C	66	Glycerol has the structure: (It is also called propane-1,2,3-triol) 
2008 MC 15	B	73	☒A Formula = C_6H_{14} ∴ Different no. of carbons so not an isomer of heptane C_7H_{16} ☑B Formula = C_7H_{16} ∴ an isomer of heptane C_7H_{16} ☒C Formula = C_7H_{14} ∴ Different no. of hydrogens so not an isomer of heptane C_7H_{16} ☒D Formula = C_7H_{14} ∴ Different no. of hydrogens so not an isomer of heptane C_7H_{16}
2009 MC 16	A	85	Main Chain: Carbon 1 Carbon 2 Carbon 3 Carbon 4 Carbon 5 in brackets $CH_3\,CH(CH_3)\,CH(OH)\,C(CH_3)_3$ Side chains: $-CH_3$ side group; $-OH$ side group; 2x $-CH_3$ sidegroups
2013 MC 10	C	90	Isomers have same molecular formula but different structural formula. Chemical in question has a formula of C_5H_{12} ☒A chemical has a formula of C_5H_{10} ∴ not an isomer because of different formula ☒B chemical has a formula of C_5H_{10} ∴ not an isomer because of different formula ☑C chemical has a formula of C_5H_{12} ∴ same formula but different structure ☒D chemical has a formula of C_6H_{14} ∴ not an isomer because of different formula
2015 MC 16	B	82	☒A structure drawn a molecular formula of C_6H_{14} but heptane has formula C_7H_{16} ☑B structure drawn has formula C_7H_{16} and a different structure from heptane ☒C structure drawn a molecular formula of C_7H_{14} but heptane has formula C_7H_{16} ☒D structure drawn a molecular formula of C_6H_{12} but heptane has formula C_7H_{16}

<table>
<tr><th>Int2</th><th>Answer</th><th>Reasoning</th></tr>
<tr><td>2000
1b</td><td>  </td><td>
<table>
<tr><td rowspan="2">Isomers</td><td>Same molecular formula e.g. C_3H_8O</td></tr>
<tr><td>Different structural formula</td></tr>
</table>
Propan-1-ol: Primary alcohol with –OH group attached to C_1 of 3 carbons
Propan-2-ol: Secondary alcohol with –OH group attached to C_2 of 3 carbons
</td></tr>
<tr><td>2001
5b(i)</td><td>Gases produced are unsaturated</td><td>The products of cracking contain unsaturated compounds with C=C double bonds.</td></tr>
<tr><td>2003
14a</td><td>  </td><td>Any correct structure of cyclohexene C_6H_{10}</td></tr>
<tr><td>2007
6a</td><td>
<table>
<tr><td></td><td>unsaturated</td></tr>
<tr><td>bromine decolourises</td><td></td></tr>
<tr><td>No change</td><td></td></tr>
<tr><td></td><td>unsaturated</td></tr>
</table>
</td><td>
<table>
<tr><td>A</td><td>C_6H_{14}</td><td>No change</td><td>saturated</td><td>C_6H_{14} is hexane: no C=C double bonds</td></tr>
<tr><td>B</td><td>C_6H_{12}</td><td>Bromine decolourises</td><td>unsaturated</td><td>C_6H_{12} is hexene: C=C double bond decolourises bromine</td></tr>
<tr><td>C</td><td>C_6H_{12}</td><td>No change</td><td>saturated</td><td>C_6H_{12} is cyclohexane: no C=C double bonds</td></tr>
<tr><td>D</td><td>C_6H_{10}</td><td>Bromine decolourises</td><td>unsaturated</td><td>C_6H_{10} is cyclohexene: C=C double bond decolourises Br_2</td></tr>
</table>
</td></tr>
<tr><td>2011
11c(i)</td><td>colourless → orange/red</td><td>Colourless → Orange/Red
Bromine added from burette reacts with Limonene in flask and flask stays colourless
When Limonene has completely reacted with bromine, bromine remains in the flask and flask is orange/red.</td></tr>
<tr><td>2012
5a</td><td>Answer to include:</td><td>Family with similar chemical properties and same general formula</td></tr>
<tr><td>2012
8a</td><td>
<table>
<tr><td></td><td>Saturated</td></tr>
<tr><td>Bromine decolourises</td><td></td></tr>
<tr><td>No change</td><td></td></tr>
<tr><td></td><td>Unsaturated</td></tr>
</table>
</td><td>
<table>
<tr><th>Hydrocarbon</th><th>Answer</th><th>Reasoning</th></tr>
<tr><td>A</td><td>Saturated</td><td>Hydrocarbons which do not change bromine are saturated</td></tr>
<tr><td>B</td><td>Bromine decolourises</td><td>Unsaturated C_6H_{12} is hexane and decolourises bromine solution</td></tr>
<tr><td>C</td><td>No change</td><td>Saturated C_6H_{12} is cyclohexane and does not decolourise bromine</td></tr>
<tr><td>D</td><td>Unsaturated</td><td>Hydrocarbons which decolourises bromine quickly are unsaturated</td></tr>
</table>
</td></tr>
<tr><td>2013
8b</td><td>Increase in carbons increases the viscosity</td><td>The higher the number of carbons in a hydrocarbon, the higher the viscosity (thickness) of the hydrocarbon. The marble will take longer to fall through the more viscous liquids.</td></tr>
<tr><td>2014
7a(iii)</td><td>Any C_8H_{18} structure other than 3-methylheptane.

Structure must have
8 carbons
18 hydrogens
4 bonds per carbon
1 bond per hydrogen</td><td>All the isomers of octane are listed below. Be sure not to redraw 3-methylheptane again.
<table>
<tr><td>octane</td><td>2-methylheptane</td></tr>
<tr><td><s>3-methylheptane</s></td><td>4-methylheptane</td></tr>
<tr><td>2,2-dimethylhexane</td><td>2,3-dimethylhexane</td></tr>
<tr><td>2,4-dimethylhexane</td><td>2,5-dimethylhexane</td></tr>
<tr><td>3,3-dimethylhexane</td><td>3,4-dimethylhexane</td></tr>
<tr><td>3-ethylhexane</td><td>2,3,4-trimethylpentane</td></tr>
<tr><td>2,2,3-trimethylpentane</td><td>2,2,4-trimethylpentane</td></tr>
<tr><td>2,3,3-trimethylpentane</td><td>3-ethyl-2-methylpentane</td></tr>
<tr><td>3-ethyl-3-methylpentane</td><td>2,2,3,3-tetramethylbutane</td></tr>
</table>
</td></tr>
<tr><td>2014
8a(ii)</td><td>No C=C double bonds</td><td>Saturated hydrocarbons contain C-C single bonds in the carbon chain of the molecule. Unsaturated hydrocarbons contain C=C double bonds (or C≡C triple bonds) which are detected by the decolourisation of bromine solution.</td></tr>
</table>

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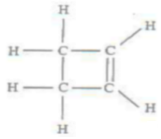
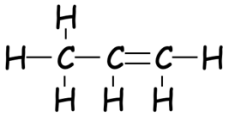
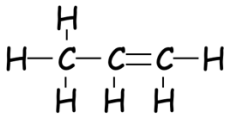
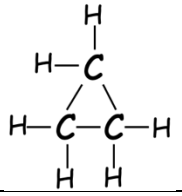
Unit 2.1 Naming and Drawing Hydrocarbons

Outcome	2000 Credit	2001 Credit	2002 Credit	2003 Credit	2004 Credit	2005 Credit	2006 Credit	2007 Credit	2008 Credit	2009 Credit	2010 Credit	2011 Credit	2012 Credit	2013 Credit		
1	18a	17a			20a					19b		22a				
2																
3																
4																
5		10a 10b										16a				
6a																
6b		10c			20d			16b(ii)	19b							
7																

<table>
<tr><th>SG Credit</th><th>Answer</th><th>Reasoning</th></tr>
<tr><td>2000C
18a</td><td>family of compounds with similar chemical properties and a general formula</td><td>
<table>
<tr><td>Homologous Series</td><td>Alkane</td><td>Alkene</td><td>Cycloalkane</td><td>Alcohol</td><td>Carboxylic Acids</td></tr>
<tr><td>General Formula</td><td>C_nH_{2n+2}</td><td>C_nH_{2n}</td><td>C_nH_{2n}</td><td>$C_nH_{2n+1}OH$</td><td>$C_nH_{2n+1}COOH$</td></tr>
</table>
</td></tr>
<tr><td>2001C
10a</td><td>no effect</td><td>C_5H_{12} is pentane. Alkanes do not decolourise bromine solution</td></tr>
<tr><td>2001C
10b</td><td>cyclohexane</td><td>C_6H_{12} can be hexene or cyclohexane. As bromine solution is not decolourised it cannot have C=C double bonds ∴ B is cyclohexane</td></tr>
<tr><td>2001C
10c</td><td>isomers</td><td>Isomers have the same formula but have different structures:
• C is a cycloalkane with five carbons e.g. cyclopentane
D is an alkene with 5 carbons e.g. pent-1-ene, pent-2-ene, etc.</td></tr>
<tr><td>2001C
17a</td><td>a family of compounds with similar chemical properties and a general formula</td><td>
<table>
<tr><td>Homologous Series</td><td>Alkane</td><td>Alkene</td><td>Cycloalkane</td><td>Alcohol</td><td>Carboxylic Acids</td></tr>
<tr><td>General Formula</td><td>C_nH_{2n+2}</td><td>C_nH_{2n}</td><td>C_nH_{2n}</td><td>$C_nH_{2n+1}OH$</td><td>$C_nH_{2n+1}COOH$</td></tr>
</table>
</td></tr>
<tr><td>2004C
20a</td><td>Family of compounds with similar chemical properties and a general formula</td><td>alkanes, alkenes, cycloalkanes, alcohols and carboxylic acid are all different homologous series with similar chemical properties and a general formula.</td></tr>
<tr><td>2004C
20d</td><td>  </td><td>A double bond saves two hydrogens in the formula. A cyclo-ring saves two hydrogens in the formula.</td></tr>
<tr><td>2007C
16b(ii)</td><td>isomers</td><td>Isomers have same molecular formula but different structural formula</td></tr>
<tr><td>2008C
19b</td><td>isomers</td><td>Isomers have the same molecular formula but
different structural formula</td></tr>
<tr><td>2009C
19b</td><td>Homologous series</td><td>Homologous series are families of compounds with similar chemical properties and a general formula:
e.g. alkanes. akenes, cycloalkanes, alcohols and carboxylic acids</td></tr>
<tr><td>2011C
16a</td><td>  </td><td>
<table>
<tr><td>Propene C_3H_6</td><td>Cyclopropane C_3H_6</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Decolourises bromine solution as it contains C=C double bond</td><td>Does not decolourises bromine solution as it does not contains C=C double bond</td></tr>
</table>
</td></tr>
<tr><td>2011C
22a</td><td>Family of compounds with similar chemical properties</td><td>Homologous series are families of compounds with similar chemical properties and gradually changing physical properties.</td></tr>
</table>

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Past Paper Question Bank

Unit 2.1 Naming and Drawing Hydrocarbons

Outcome	2000 General	2001 General	2002 General	2003 General	2004 General	2005 General	2006 General	2007 General	2008 General	2009 General	2010 General	2011 General	2012 General	2013 General		
1																
2																
3			10a			11a		9a								
4	9a			10c(i)												
5	9b						14b(ii)	14b(ii)		13b(i)		20c	20b	15b		
6a																
6b																
7																

SG General	Answer	Reasoning
2002G 10a	compound containing carbon & hydrogen only	Hydrocarbons are compounds which contain carbon and hydrogen only. Hydrocarbons often come in families e.g. alkanes, alkenes and cycloalkanes
2003G 10c(i)	no C=C bonds	Saturated hydrocarbons have C-C single bonds in them and do not decolourise bromine solution. Unsaturated hydrocarbons contain at least one C=C double bond which will decolourise bromine solution quickly.
2005G 11a	a compound of carbon and hydrogen only	Hydrocarbons contain the elements carbon + hydrogen only
2006G 14b(ii)	bromine solution is decolourised	bromine solution decolourises quickly in the presence of C=C double bonds. This indicated the substance being tested is unsaturated.
2007G 9a	Carbon and Hydrogen	Hydrocarbon: compounds which contain carbon and hydrogen only
2007G 14b(ii)	Contains C=C double bond or unsaturated	Unsaturated C=C double bonds decolourise bromine solution quickly
2009G 13b(ii)	C_7H_{14}	C_7H_{14}: heptene – alkene with general formula C_nH_{2n} C_9H_{20}: nonane – alkane with general formula C_nH_{2n+2}
2011G 20c	decolourises bromine solution	Alkenes are unsaturated. Unsaturated compounds decolourise bromine solution quickly as the bromine molecule adds across the C=C double bond.
2012G 20b	contains C=C double bond or unsaturated	Bromine solution is quickly decolourised by unsaturated compounds containing C=C double bonds.
2013 15b	Bromine solution decolourises	Bromine solution will decolourise as the bromine Br_2 molecule adds across the C=C double bond in propene.