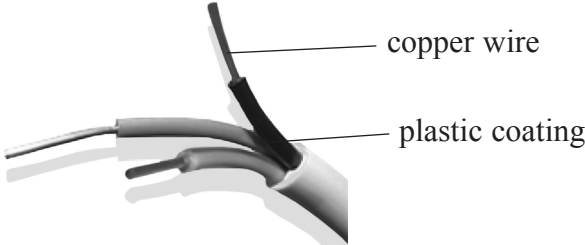


1	2	Key										3	4	5	6	7	0								
		relative atomic mass atomic symbol name atomic (proton) number																							
7	Li lithium 3	9	Be beryllium 4											11	12	14	16	19	20						
23	Na sodium 11	24	Mg magnesium 12											27	28	31	32	35.5	40						
39	K potassium 19	40	Ca calcium 20	45	48	51	52	55	56	59	59	63.5	65	70	73	75	79	80	84						
85	Rb rubidium 37	88	Sr strontium 38	89	91	93	96	[98]	101	103	106	108	112	115	119	122	128	127	131						
133	Cs caesium 55	137	Ba barium 56	139	178	181	184	186	190	192	195	197	201	204	207	209	[209]	[210]	[222]						
[223]	Fr francium 87	[226]	Ra radium 88	[227]	Ac* actinium 89	[261]	Rf rutherfordium 104	[262]	Db dubnium 105	[266]	Sg seaborgium 106	[264]	Bh bohrium 107	[277]	Hs hassium 108	[268]	Mt meitnerium 109	[271]	Ds darmstadtium 110	[272]	Rg roentgenium 111	Elements with atomic numbers 112-116 have been reported but not fully authenticated			

The relative atomic masses of copper and chlorine have not been rounded to the nearest whole number.



<p>1. The photograph shows copper wires coated with plastic in an electric cable.</p> <div data-bbox="730 676 1276 905"></div> <p>(a) Why is copper used in this cable?</p> <p>Put a cross (☒) in the box to show your answer.</p> <table><tr><td>it is brittle</td><td><input type="checkbox"/></td></tr><tr><td>it conducts electricity</td><td><input checked="" type="checkbox"/></td></tr><tr><td>it is an insulator</td><td><input type="checkbox"/></td></tr><tr><td>it is dense</td><td><input type="checkbox"/></td></tr></table> <p>(1)</p> <p>(b) Why is plastic used to coat the copper wires in this cable?</p> <p>Put a cross (☒) in the box to show your answer.</p> <table><tr><td>it is brittle</td><td><input type="checkbox"/></td></tr><tr><td>it conducts electricity</td><td><input checked="" type="checkbox"/></td></tr><tr><td>it is an insulator</td><td><input type="checkbox"/></td></tr><tr><td>it is dense</td><td><input type="checkbox"/></td></tr></table> <p>(1)</p> <p>(c) One method of disposing of waste plastics is by burning them.</p> <p>Suggest a problem that can be caused by burning waste plastics.</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>(1)</p>	it is brittle	<input type="checkbox"/>	it conducts electricity	<input checked="" type="checkbox"/>	it is an insulator	<input type="checkbox"/>	it is dense	<input type="checkbox"/>	it is brittle	<input type="checkbox"/>	it conducts electricity	<input checked="" type="checkbox"/>	it is an insulator	<input type="checkbox"/>	it is dense	<input type="checkbox"/>	<p>Leave blank</p>
it is brittle	<input type="checkbox"/>																
it conducts electricity	<input checked="" type="checkbox"/>																
it is an insulator	<input type="checkbox"/>																
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it is dense	<input type="checkbox"/>																



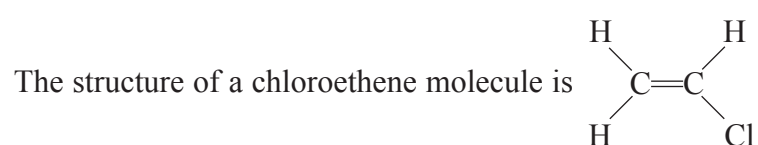
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- (d) For some uses, copper is mixed with another metal to form a new solid.

Give the name for solids which are mixtures of metals.

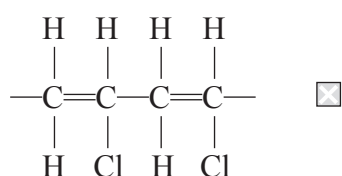
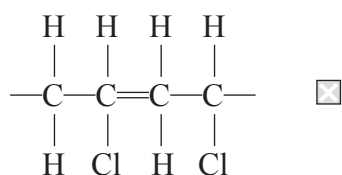
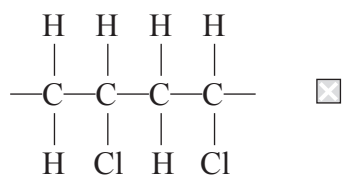
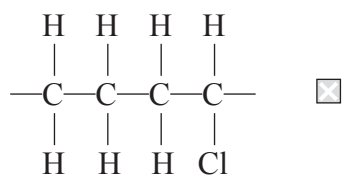
.....
(1)

- (e) The plastic used to coat the copper wires is the polymer, PVC.
This polymer is made by combining many molecules of chloroethene together.



Which diagram shows part of the structure of the polymer molecule?

Put a cross (☒) in the box to show your answer.



(1)

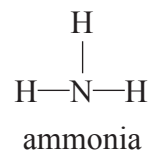
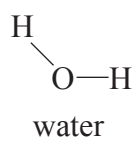
Q1

(Total 5 marks)



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2. The diagrams show a molecule of water and a molecule of ammonia.



- (a) Give the name of the element that is combined in both of these molecules.

..... (1)

- (b) The formula of a molecule of water is H_2O .

What is the formula of a molecule of ammonia?

..... (1)

- (c) Water and ammonia both have the same type of structure.

What structure do they have?

Put a cross (☒) in the box to show your answer.

giant molecular, covalent ☒

giant ionic ☐

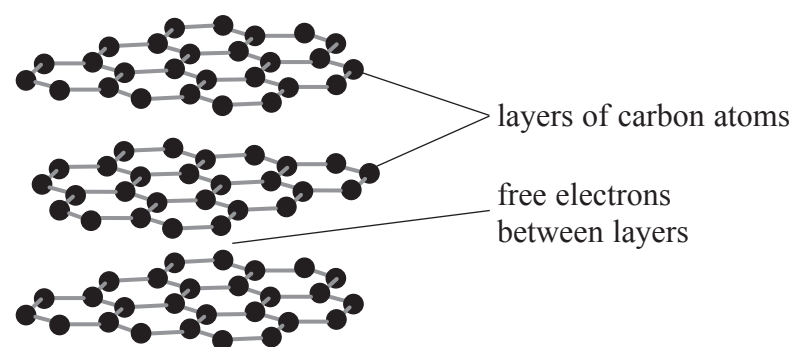
metallic ☐

simple molecular, covalent ☒

(1)



(d) The diagram shows the structure of graphite.



Explain how graphite conducts electricity.

.....

.....

.....

.....

(2)

(Total 5 marks)

Leave
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Q2



3. Changing various factors can affect the rates of chemical reactions.

(a) Zinc reacts with dilute hydrochloric acid to produce zinc chloride and hydrogen.

(i) Complete the word equation for this reaction.

zinc + → zinc chloride + (1)

(ii) The rate of this reaction is affected by the concentration of the acid and temperature of the acid.

Draw a straight line from each change made to the acid to the effect the change has on the rate of the reaction.

change made to hydrochloric acid

effect of change on rate of reaction

decrease in concentration	increases
increase in temperature	no change
	decreases

(2)

(b) In an experiment, a lump of marble is reacted with dilute hydrochloric acid.

Explain how the rate of reaction would have been affected if this lump of marble had been ground to a powder before being used in the reaction.

.....

.....

.....

.....

.....

(2)

Q3

(Total 5 marks)

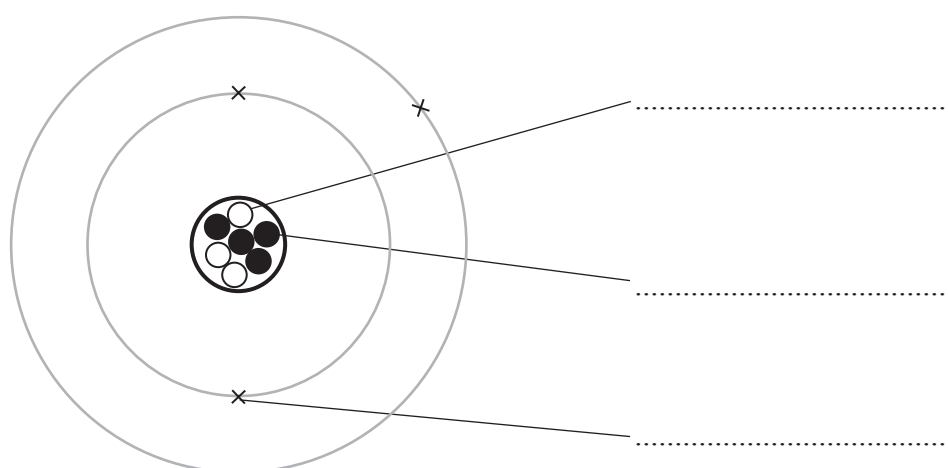


4. (a) A proton has a positive charge.
A neutron has no charge.
An atom of any element is neutral.

What charge must an electron have?

.....
(1)

- (b) A lithium atom contains electrons, neutrons and protons.
The structure of a lithium atom is shown in the diagram.



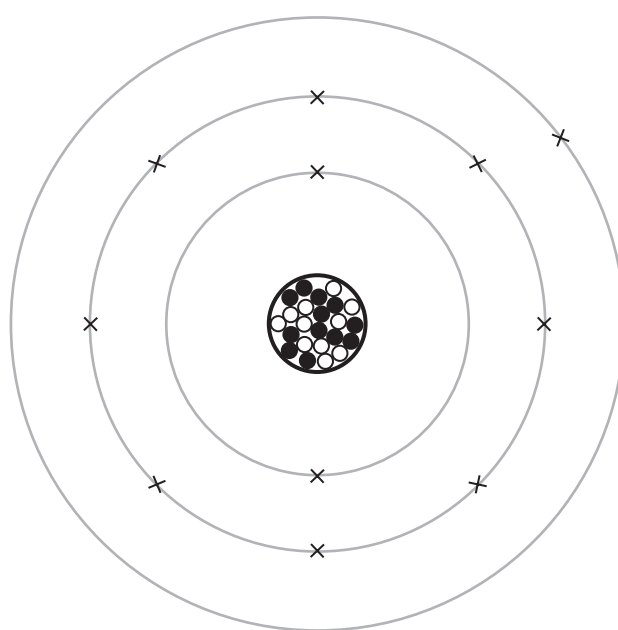
- (i) Label the diagram to show the positions of an electron, a neutron and a proton.
(2)

- (ii) The lithium atom shown in the diagram has a mass number of 7.

Explain how the diagram shows that the mass number of this lithium atom is 7.

.....
.....
(1)

(iii) The structure of an atom of sodium is shown in the diagram.



The electronic configuration of a lithium atom is 2.1.

What is the electronic configuration of a sodium atom?

.....

(1)

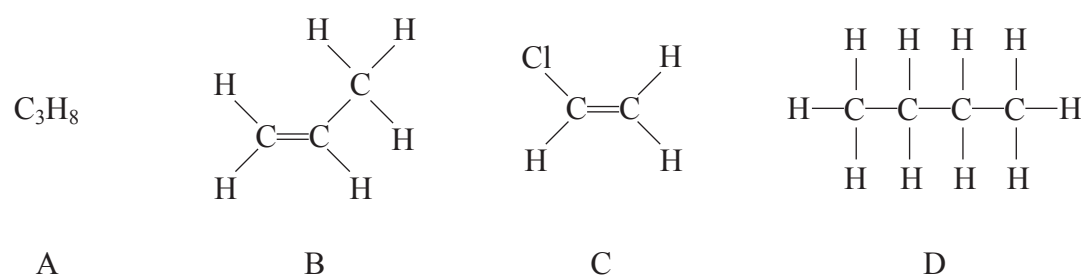
(Total 5 marks)

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Q4



5. The formulae of the molecules of four organic compounds, A, B, C and D, are shown below.



- (a) Which **two** compounds are alkanes?

..... (1)

- (b) Cracking is used in industry to convert heavier fractions obtained from crude oil into more useful products.

Which compound **cannot** be produced by the cracking of a larger alkane molecule?

Put a cross (☒) in the box to show your answer.

compound A ☐

compound B ☐

compound C ☐

compound D ☐

(1)

- (c) Draw the structure of a molecule of compound A, showing all bonds.

(1)

- (d) The atoms in a molecule of compound D are held together by shared pairs of electrons.

What type of bond is formed by a shared pair of electrons?

..... (1)



Leave
blank

- (e) Compound B is an unsaturated hydrocarbon.
Compound D is a saturated hydrocarbon.

Explain why compound B is **unsaturated**.

.....
.....
.....

(1)

- (f) A reagent can be added to a saturated hydrocarbon and to an unsaturated hydrocarbon
to distinguish between them.

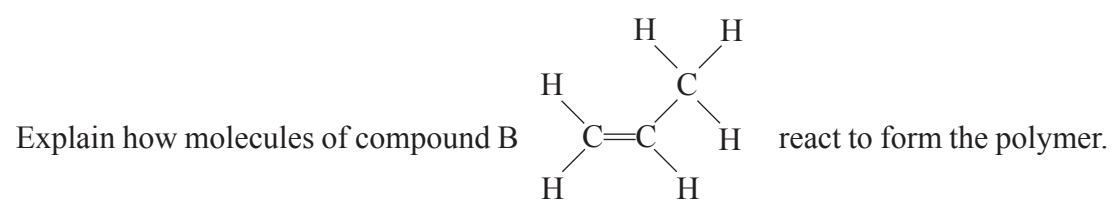
Give the name of this reagent and describe what happens when it is mixed with each
hydrocarbon.

.....
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(3)



(g) Molecules of compound B can form the polymer poly(propene).



.....

.....

.....

.....

.....

.....

(2)

Q5

(Total 10 marks)

TOTAL FOR PAPER: 30 MARKS

END

