AQA 9-1 CHEMISTRY (H) PAPER 1 TEST - SET 1

Name:

Date:

GCSE Combined Science practice questions - like the exam!

1hr 15 mins allowed for the paper. Max marks = 70

For markers use only:

Markers signature :

Achieved marks

Q1 =

Q2 =

Q3 =

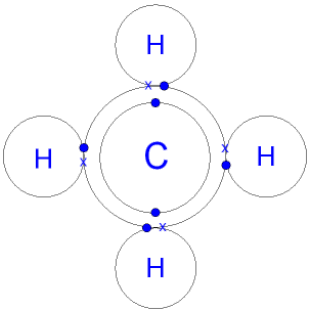
Q4 =

Q5 =

Q6 =

Q7 =

Q1. Here is a molecule of methane:



Q1.1 In figure 1, what does the ‘x’ represent? **[1 mark]**

Q1.2 What are the differences between protons, neutrons and electrons? **[4 marks]**

Q1.3 Draw the arrangement of electrons in a magnesium atom. **[3 marks]**

Q1.4 What is the chemical formula for methane? Tick **one** box **[1 mark]**

CH ☐

CH4 ☐

C4H ☐

CH_4 ☐

Q2. This question is about carbon dioxide. Carbon dioxide is a simple molecule.

Q2.1* Carbon Dioxide is a gas. Describe the differences between gases, liquids and solids. **[6 marks]**

Q2.2 375g of zinc carbonate is heated to produce 243g of zinc oxide. What can also be produced? **[1 mark]**

Q2.3 From the above values, work out the mass produced. **[1 mark]**

Q3.1 Draw a reaction profile for an exothermic reaction. Include all key details. **[4 marks]**

Q3.2* A student wants to investigate the reactivity of four metals. Outline a plan that the student could use to investigate the reactivity of four different powdered metals. Use the fact that that all four metals react exothermically with dilute sulfuric acid. **[6 marks]**

Q3.3 What is activation energy? **[2 marks]**

Q4.1 Describe the bonding between magnesium and oxygen. Use diagrams and give the formula formed **[6 marks]**

Q4.2 What element is made from diamond and graphite and which one conducts electricity? **[2 marks]**

Q4.3 What is a giant covalent structure? Give the example in this case. **[2 marks]**

Q4.4 What is a polymer? **[2 marks]**

Q5.1 A drink is tested and found to be pH 3, what does this tell us? What would you use to measure the pH? **[2 marks]**

Q5.2 Compare bases, alkalis and acids. **[4 marks]**

Q5.3 What is an OH- ion? **[1 mark]**

Alkali ☐

Base ☐

Hydroxide ion ☐

Hydrogen ion ☐

Q5.4 What is equation for the reaction between an acid and a base and what is it called? **[2 marks]**

Q5.5 What is a neutral pH? **[1 mark]**

7 ☐

12 ☐

Q6.1 What is the plum pudding model? Describe its features. **[4 marks]**

Q6.2 Who showed that the plum pudding model was wrong? What were their names? **[2 marks]**

Q6.3 Outline what the nuclear model is and who discovered it. **[3 marks]**

Q6.4 What is the electronic structure for nitrogen? **[1 mark]**

Q7.1 2.5g of hydrogen is added to 37.5g of chlorine to produce hydrogen chloride. The equation for this reaction is H2+ Cl2 (arrow) 2HCl. What is the limiting reaction? The relative formula masses is H2= 2 and Cl2 = 71 **[3 marks]**

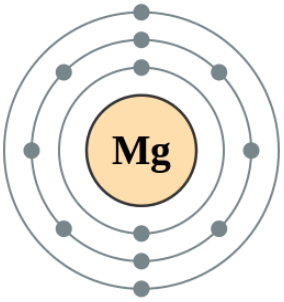
Q7.2 How many electrons are there in Group 0 and what is the name of group 0? **[2 marks]**

Q7.3 Halogens change as you go down the group. Describe the changes. **[4 marks]**

END OF QUESTIONS

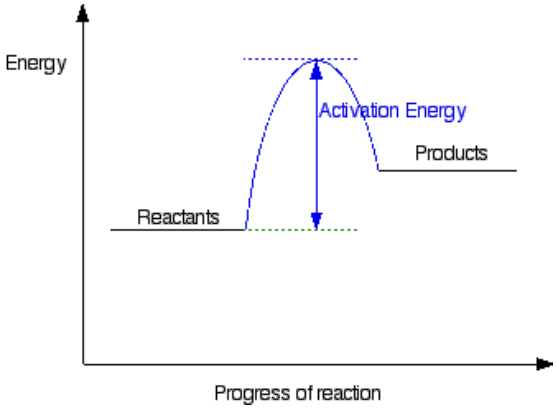
EXAM MARK SCHEME:

Q1.1 = electron
Q1.2 = electrons = move around in shells, negatively charged. Very small etc…
Neutrons = a subatomic particle of about the same mass as a proton but without an electric charge etc … Proton = positively charge, +1 relative mass etc…
ANY VALID POINTS would get 4 marks.

Q1.3 = 

Q1.4 = CH(small four) - only accept small four.

Q2.1 = Solids - strong forces of attraction between particles, regular lattice. Don't move from positions, definite shape & volume. Vibrate about their positions, expand when heated.
Liquids = Weak forces of attraction, randomly arranged, free to move, stick closely together. Definite volume but no definite shape. Constantly moving with random motion. Expands when heated.
Gases - weakest force of attraction. Free to move & far apart. Travel in straight lines. Don't keep a definite shape or volume. Random motion, move faster, causes liquids to expand when heated.
ANY OTHER VALID POINTS.
Q2.2 = Carbon Dioxide
Q2.3 = 375-243 = 132g

Q3.1 = 

Q3.2 =Indicative content

Named apparatus

• thermometer
• measuring cylinder
• stirring rod
• spatula
• plastic cup (with lid) or beaker
• stopwatch
• filter paper or watch glass
• balance

Method

• weigh the same mass of each metal in each same state of division eg powder
• measure a set volume of sulfuric acid into a plastic cup or beaker
• measure and record the temperature of the sulfuric acid
• add one of the metals into the plastic cup or beaker
• stir and record the highest temperature or record the temperature after a set time
• calculate the increase in temperature
• repeat for each metal at least three times to calculate a mean

Safe use

• comment on safe use should include wearing safety glasses

OTHER VALID POINTS.

Q3.3 Activation energy is the minimum amount of energy needed for the reactants to collide with each other and react.

Q4.1 = Magnesium loses two electrons, becomes 2+ positive ion. Oxygen gains 2 electrons, becomes 2- negative ion. Now have full outer shells, MgO formed.
ANY OTHER VALID POINTS (accept diagrams)
Q4.2 = Carbon + Graphite due to delocalised electrons.
Q4.3= Extremely strong structures because of the many bonds involved - lattice. Diamond or Graphite is giant covalent.
Q4.4 = A polymer is where lots of small units are linked to form a long molecule. Atoms joined by strong covalent bonds.

Q5.1 = Acid. pH probe/universal indicator.
Q5.2 = Acids have a pH of less than 7. Bases have a pH of more than 7. When bases are dissolved in water, known as alkalis. Salts are made when an acid reacts with a base. Alkalis are bases that are soluble in water. Any other valid points etc...
Q5.3 = Hydroxide ion
Q5.4 = Neutralisation; metal + acid → salt + hydrogen
Q5.5 = 7

Q6.1 = The plum pudding model of the atom was proposed by JJ Thomson, it was put forth before the discovery of the nucleus. According to this model, the atom is a sphere of positive charge, and negatively charged electrons are embedded in it to balance the total positive charge. Any other valid points would get 4 marks.
Q6.2 Rutherford & Marsden.
Q6.3 = Bohr. Atoms contain three sub-atomic particles called protons, neutrons and electrons. The protons and neutrons are found in the nucleus at the centre of the atom. Electrons orbit the nucleus.
Q6.4 = 2,5

Q7.1 = 2.5/2 = 1.25, 37.5/71 = 0.528 - Chlorine is limiting reactant - lowest value.
Q7.2 = 8; Noble gases.
Q7.3 = have 7 electrons in the outer shell
• need to gain an electron
• form ions with a -1 charge
• halogens further down the group are less reactive
• halogens further down the group have more shells or
energy levels
Less shielding etc..
ANYTHING VALID WOULD GET 4 MARKS.

END OF MARK SCHEME

GRADE BOUNDARIES:

These are **NOT** an accurate representation of what you would get but this is what I would base the grades on.

MARKS to get the grade:

4 = 13 marks
5 = 22 marks
6 = 29 marks
7 = 38 marks
8 = 49 marks
9 = 57 marks