

N5 Chemistry
Unit 3: Chemistry in Society
Homework 3.4

Name _____

Teacher _____

1. Which of the following metals is extracted by heat alone?

- A Aluminium
- B Iron
- C Silver
- D Zinc

Answer _____

2. Which of the following statements is true about iron?

- A It is found uncombined in the earth.
- B It reacts vigorously with water.
- C It is a non-conductor of electricity.
- D It is extracted by heating its ore with carbon.

Answer _____

3. Metal **A** is found uncombined in the Earth's crust. Metal **B** reacts with dilute acid but not with water. Metal **C** can be displaced from a solution by metal **A**.

Which statement is true?

- A Metal **A** is more reactive than metal **B**.
- B Metal **B** could displace metal **A** from a solution of its ions.
- C Metal **A** could react with dilute acid.
- D Metal **C** is more reactive than metal **A**.

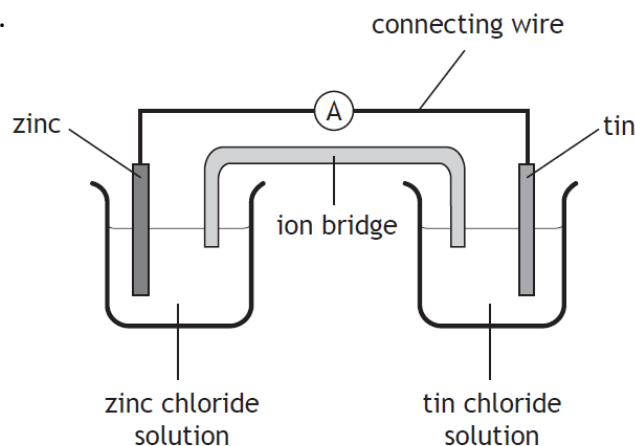
Answer _____

4. How many moles of magnesium sulfate are required to make 250 cm³ of 0.5 mol l⁻¹ solution?

- A 0.125
- B 0.25
- C 0.5
- D 2.0

Answer _____

5.

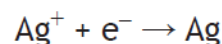
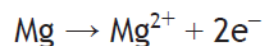


In the cell shown, electrons flow through

- A the solution from tin to zinc
- B the solution from zinc to tin
- C the connecting wire from tin to zinc
- D the connecting wire from zinc to tin.

Answer _____

6. The ion-electron equation for the oxidation and reduction steps in the reaction between magnesium and silver(I) ions are:



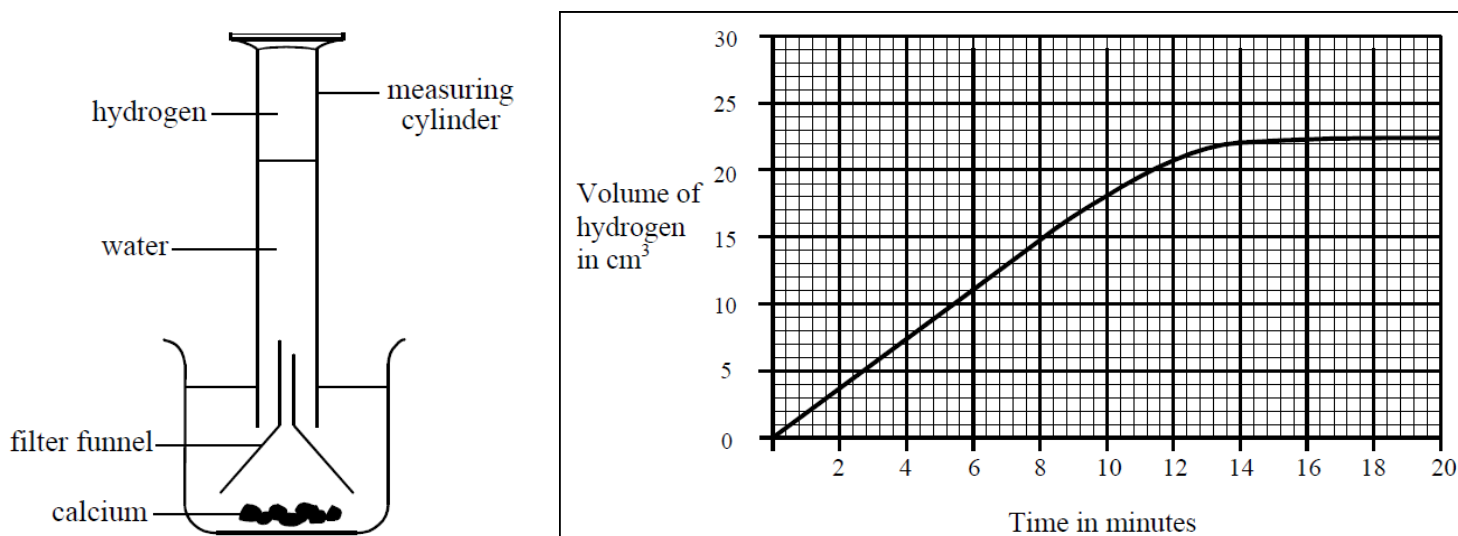
The overall redox equation is

- A $\text{Mg} + 2\text{Ag}^{+} \rightarrow \text{Mg}^{2+} + 2\text{Ag}$
- B $\text{Mg} + \text{Ag}^{+} \rightarrow \text{Mg}^{2+} + \text{Ag}$
- C $\text{Mg} + \text{Ag}^{+} + \text{e}^{-} \rightarrow \text{Mg}^{2+} + \text{Ag} + 2\text{e}^{-}$
- D $\text{Mg} + 2\text{Ag} \rightarrow \text{Mg}^{2+} + 2\text{Ag}^{+}$.

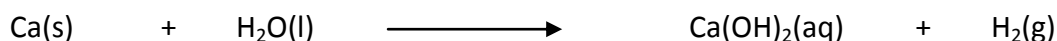
Answer _____

6

7. Calcium was reacted with water as shown and the volume of hydrogen produced was measured every two minutes. A graph of the results is also shown.



- a) The equation for the reaction is



Balance this equation.

1

- b) Calculate the average rate of reaction during the first 10 minutes.
Space for working and answer.

_____ cm³ min⁻¹

2

- c) Suggest what happens to the pH value of the water as the reaction proceeds.

1

- d) Why does the volume stop increasing after 16 minutes?

1

- e) Give the oxidation equation for the reaction of calcium to form calcium ions.
You may wish to refer to the data booklet.

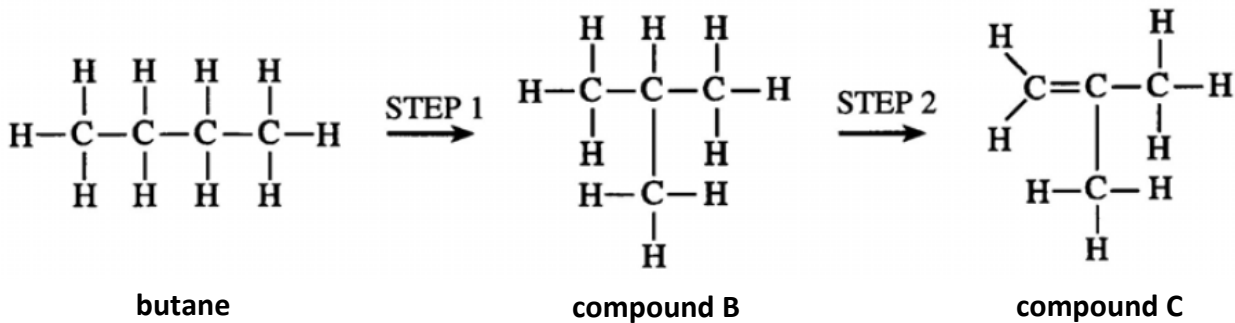
1

8. A student was preparing for their National 5 Chemistry exam paper and started to write out a word bank with some of the important terms. Unfortunately the student failed to complete their word bank as shown below.

Complete the table to show each word with a correct meaning.

Word	Meaning
Ore	
	Atoms with the same atomic number but a different mass number.
Reduction	
Hydrocarbon	
	A family of hydrocarbon compounds which contain at least one carbon-to-carbon double bond.
	A compound which reacts with an acid. Examples include metal oxides and metal carbonates.
Diatomic	
Fuel	
	The centre of an atom which contains the protons and neutrons.
	A type of chemical reaction where two solutions react to produce an insoluble product.
Oxidation	
Electrolysis	

9. The following reaction sequence starts with butane as shown.



a) Give the systematic names for compounds B and C.

B _____ C _____ 2

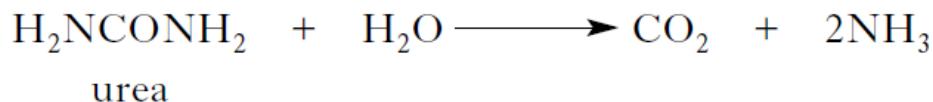
b) Butane and compound B have the same molecular formula but a different structural formula. What term can be applied to these 2 molecule?

_____ 1

c) State a chemical test, including the result, which could be carried out to prove that compound C had been formed.

_____ 1

10. Urea reacts with water, breaking down to form carbon dioxide and ammonia (NH₃).



a) Draw a diagram to show the **shape** of an ammonia molecule.

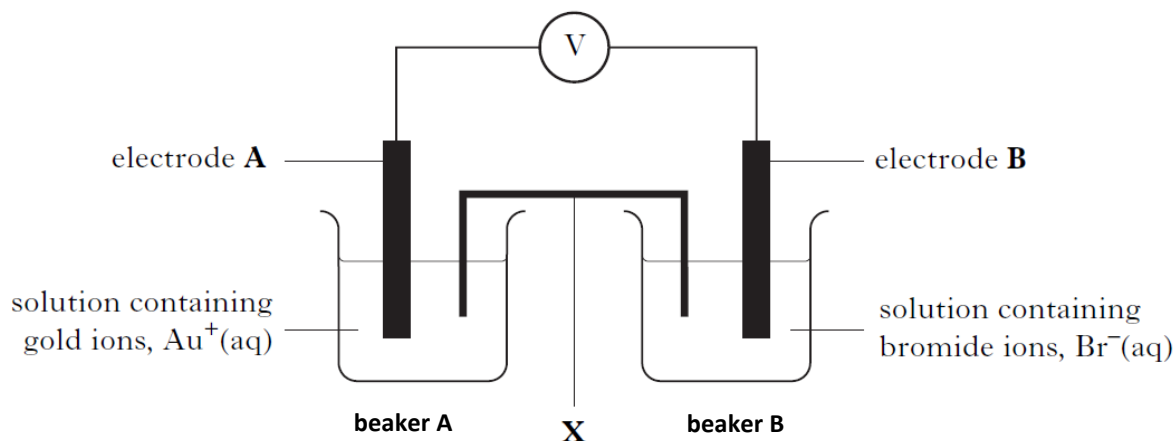
1

b) Calculate the mass of ammonia produced, in grams, when 90 g of urea breaks down.
Space for working and answer.

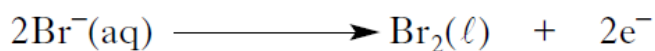
_____ grams

3

11. A technician set up the following cell.



The reaction taking place at electrode **B** is:



(a) **On the diagram**, clearly mark the path and direction of electron flow. 1

(b) Write the ion-electron equation for the reaction taking place at electrode **A**.

You may wish to use the data booklet to help you.

_____ 1

(c) Name the piece of apparatus labelled **X**.

_____ 1

(d) State the function of X in the apparatus.

 _____ 1

(e) What colour will the solution in beaker **B** gradually turn?

_____ 1

(f) In a second experiment the solution containing bromide ions is replaced with a solution containing iodide ions (I^-).

What impact will this have on:

i) Direction of electron flow through the wires? _____ 1

ii) The size of the voltage measured on the voltmeter? _____ 1

Total Marks 39