

N5 Chemistry

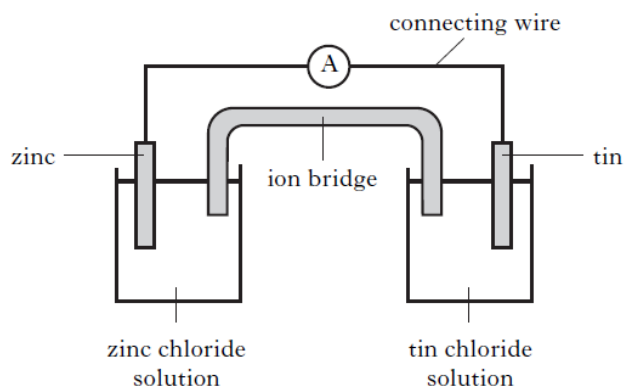
Unit 3: Chemistry in Society

Homework 3.6

Name _____

Teacher _____

1.



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 _____

2. Which line in the table shows the properties of an ionic compound?

	Melting point (°C)	Boiling point (°C)	Conducts electricity?	
			Solid	Liquid
A	181	1347	yes	yes
B	-95	69	no	no
C	686	1330	no	yes
D	1700	2230	no	no

Answer _____

3. Which of the following polymers dissolves in water?

- A Kevlar
- B Perspex
- C Poly(ethene)
- D Poly(ethenol)

Answer _____

4. Which of the following is a natural fibre?

- A Nylon
- B Polyester
- C Terylene
- D Silk

Answer _____

5. What type of reaction takes place when butene decolourises bromine solution?

- A distillation
- B addition
- C evaporation
- D condensation

Answer _____

6. What type of reaction takes place when butane reacts with oxygen forming carbon dioxide and water?

- A addition
- B fermentation
- C evaporation
- D combustion

Answer _____

7. Different isotopes of the same element have identical

- A nuclei
- B mass numbers
- C numbers of neutrons
- D number of protons.

Answer _____

8. When methane burns in a plentiful supply of air, the products are

- A carbon monoxide and water vapour
- B carbon and water vapour
- C carbon dioxide and hydrogen
- D carbon dioxide and water vapour.

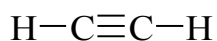
Answer _____

9. A very hot flame is produced when ethyne gas (C₂H₂) burns in a plentiful supply of oxygen.

a) Name the products formed in this reaction.

1

b) Ethyne is the first member of an homologous series called the alkynes. Ethyne has the following structure.



All members of the alkyne series have a triple carbon to carbon bond.

Complete the following table.

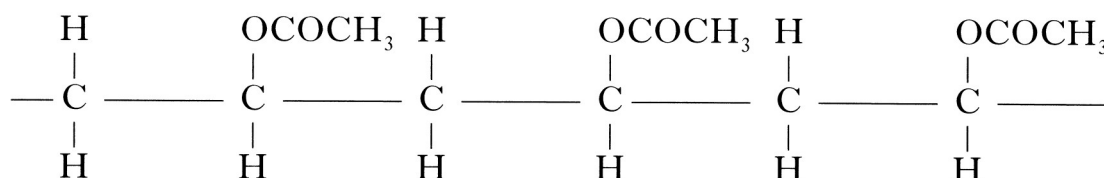
Position in series	Name	Molecular formula
1st	ethyne	C ₂ H ₂
2nd		C ₃ H ₄
3rd	butyne	

2

c) Suggest a general formula for the alkyne series.

1

10. Poly(ethenyl ethanoate) is an addition polymer. Part of its structure is shown below.



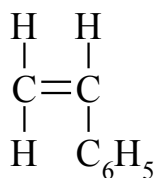
a) Draw the structural formula for the monomer used to make this polymer.

1

b) When the polymer burns a toxic gas is produced, suggest what gas this might be.

1

11. Polystyrene is an addition polymer. It is made from the monomer styrene.



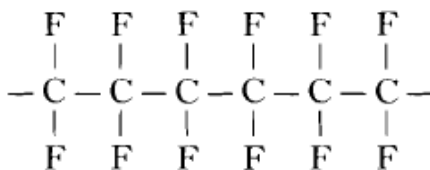
a) Draw a section of the polystyrene structure, showing **three** monomer units joined together.

1

b) What type of polymerisation occurs in forming polystyrene?

1

12. Teflon is the brand name for the plastic, poly(tetrafluoroethene).
The structure of part of a poly(tetrafluoroethene) molecule is shown below.



a) Draw the full structural formula for the monomer used to make poly(tetrafluoroethene).

1

b) Teflon is a plastic which melts on heating. What name is given to this type of plastic?

1

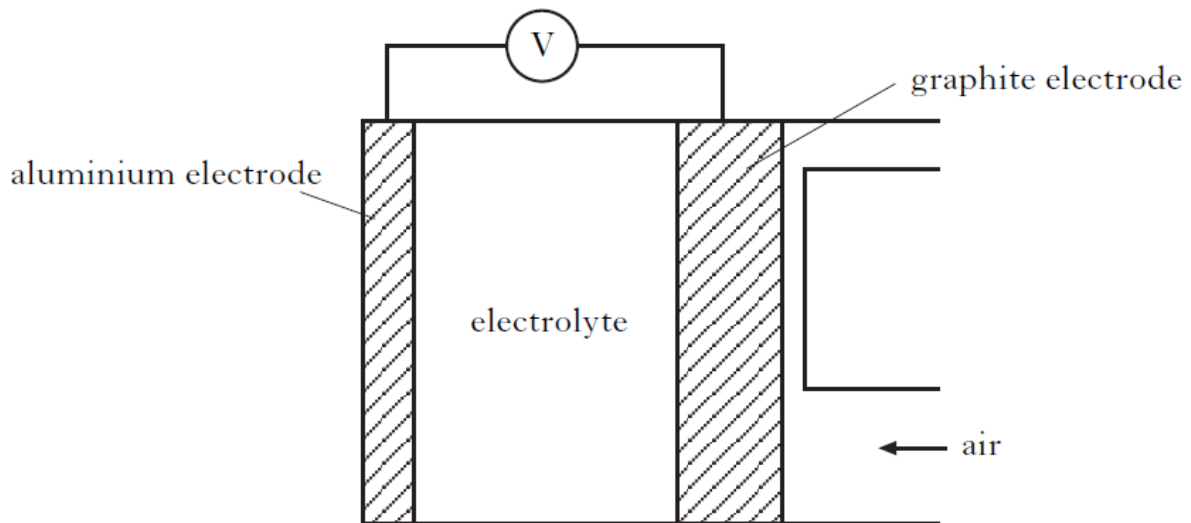
c) Calculate the percentage by mass of carbon in a molecule of carbon tetrafluoride, CF_4 .
Space for working and answer.

_____ %

3

13. A number of electrochemical cells are being developed.

One such example is the aluminium/air cell. It is used as a back-up power supply in telephone exchanges.



a) What is the purpose of the electrolyte in the cell?

1

b) The ion-electron equation for the reactions taking place at the electrodes are:

aluminium electrode	$\text{Al} \rightarrow \text{Al}^{3+} + 3\text{e}^{-}$
graphite electrode	$\text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^{-} \rightarrow 4\text{OH}^{-}$

i) What process has the aluminium electrode undergone?

1

ii) When the cell is operating, a solid forms in the electrolyte. Identify the solid. (You may wish to use page 8 of the data booklet to help you.)

1

iii) Use the ion-electron equations given above to produce a redox equation for this fuel cell.

1

14. Anglesite is an ore containing lead(II) sulphate, PbSO_4 .

- a) Calculate the percentage by mass of lead in anglesite.
Space for working and answer.

_____ %

3

- b) Most metals are found combined in the Earth's crust and have to be extracted from their ores.

Place the following metals in the correct space in the table.

lead **aluminium**

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

Metal	Method of extraction
	electrolysis of molten compound
	using heat and carbon

1

- c) Metal **X** can be extracted from its ore by heat alone. What does this indicate about the reactivity of **X** compared to both lead and aluminium?

1

- d) When a metal is extracted from its ore, metal ions are changed to metal atoms.
Name this type of chemical reaction.

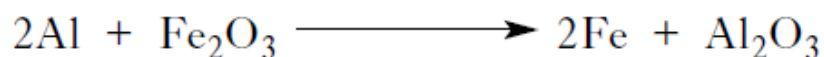
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- e) Some metals are found in the earth's crust uncombined. Give an example of metal which is found uncombined.

1

15. Molten iron is used to join steel railway lines together. Molten iron is produced when aluminium reacts with iron oxide.

The equation for this reaction is:



- a) Calculate the mass of iron produced from 40 grams of iron oxide.
Space for working and answer.

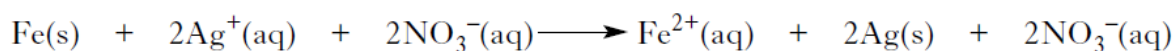
_____ grams

3

- b) The formula for iron oxide is Fe_2O_3 . What is the charge on this iron ion?

1

16. Iron displaces silver from silver(I) nitrate solution. The equation for the reaction is:

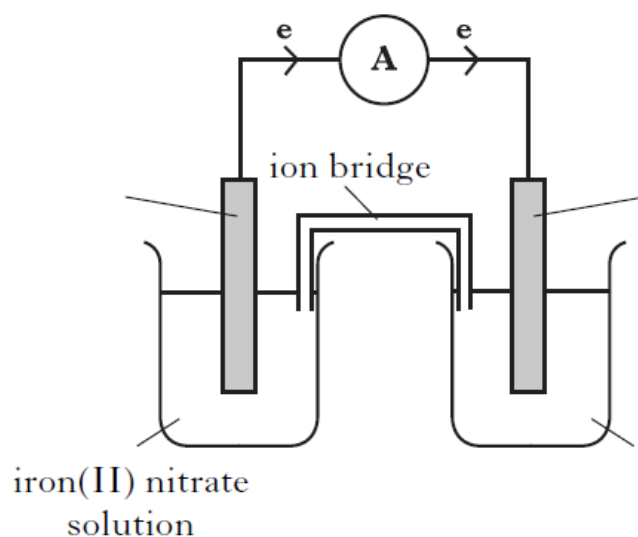


- a) **Circle** the spectator ion in the above equation.
- b) Write the ion-electron equation for the **reduction** step in the reaction.

1

1

- c) The reaction can also be carried out in a cell.



Complete the three labels on the diagram.

1

Total Marks 39