

N5 Chemistry
Unit 3: Chemistry in Society
Homework 3.3

Name _____

Teacher _____

1. Which of the following metals will not react with dilute acid?

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

Answer _____

2. Which of the following pairs of chemicals react to produce a gas that turns lime water milky?

- A Calcium carbonate and dilute hydrochloric acid
- B Copper oxide and dilute sulfuric acid
- C Copper oxide and dilute hydrochloric acid
- D Magnesium and dilute sulfuric acid

Answer _____

3. Some metals can be obtained from their metal oxides by heat alone. Which of the following oxides would produce a metal when heated?

- A Calcium oxide
- B Copper oxide
- C Zinc oxide
- D Silver oxide

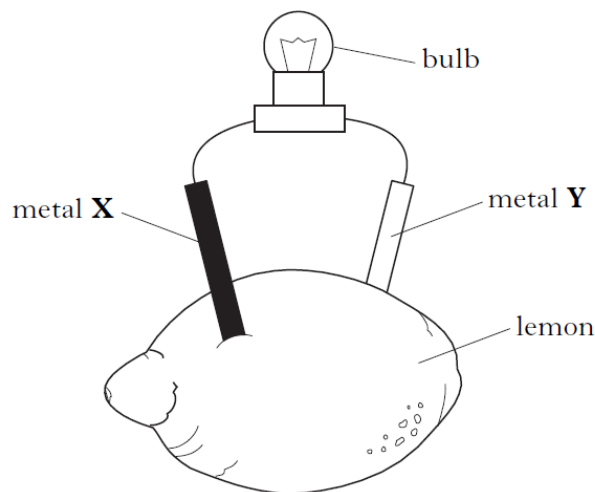
Answer _____

4. Which of the following metals is found uncombined?

- A Magnesium
- B Sodium
- C Gold
- D Iron

Answer _____

5. A cell can be made using a lemon.



Which of the following pairs of metals would give the brightest bulb?

	Metal X	Metal Y
A	magnesium	copper
B	copper	copper
C	zinc	copper
D	iron	copper

Answer _____

6. Which of the following potassium compounds is a base?

- A Potassium nitrate
- B Potassium chloride
- C Potassium sulfate
- D Potassium carbonate

Answer _____

7. The table contains information on minerals.

<i>Mineral</i>	<i>Formula</i>
cinnabar	HgS
fluorite	CaF ₂
gibbsite	Al(OH) ₃
haematite	Fe ₂ O ₃
zinc blende	ZnS

a) State the chemical name for zinc blende.

_____ 1

b) Name the salt formed when gibbsite reacts with dilute hydrochloric acid.

_____ 1

c) Calculate the percentage, by mass, of calcium in fluorite (CaF₂).

Space for working and answer

3

d) Iron metal can be extracted from haematite (Fe₂O₃) by heating with carbon monoxide. Carbon dioxide is also produced.

Write a balanced equation, using symbols and formulae, for this reaction.

_____ 2

e) Name a metal which can be extracted by heat alone.

_____ 1

f) Name a metal which must be extracted by electrolysis.

_____ 1

g) What type of chemical reaction occurs when a metal is extracted from its ore?

_____ 1

8. Many ionic compounds are coloured.

<i>Compound</i>	<i>Colour</i>
nickel(II) nitrate	green
nickel(II) sulfate	green
potassium permanganate	purple
potassium sulfate	colourless

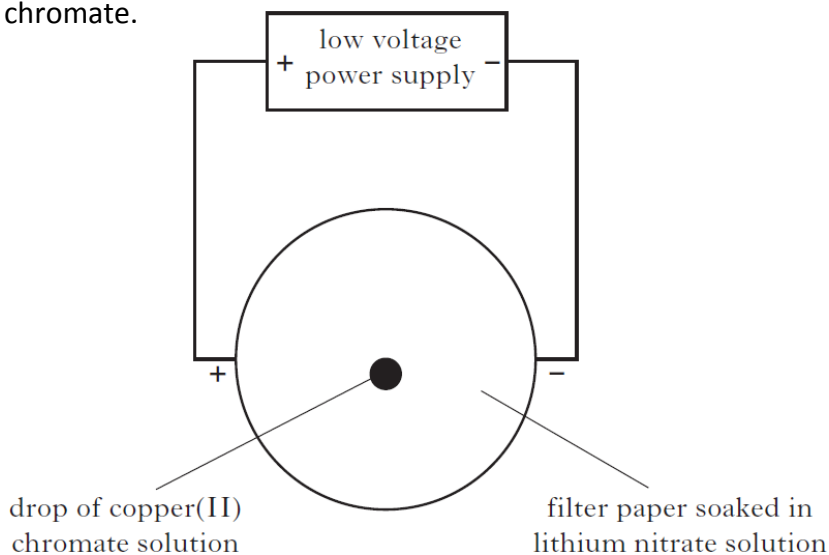
a) Using the information in the table, state the colour of the potassium ion.

_____ 1

b) Write the **ionic** formula for nickel(II) nitrate.

_____ 1

c) A student set up the following experiment to investigate the colour of the ions in copper(II) chromate.



The student made the following observation.

<i>Observation</i>
yellow colour moves to the positive electrode
blue colour moves to the negative electrode

d) i) State the colour of the chromate ion.

_____ 1

ii) Lithium nitrate solution is used as the electrolyte. What is the purpose of an electrolyte?

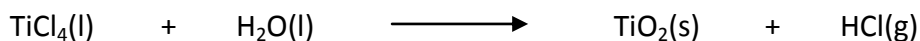
_____ 1

iii) Suggest why lithium phosphate can not be used as the electrolyte in this experiment. You may wish to use the data booklet to help you.

_____ 1

9. Titanium compounds have many uses.

a) i) Warships can produce a smokescreen by reacting titanium(IV) chloride with water:



Balance this equation.

1

ii) Titanium(IV) chloride is a liquid at room temperature. What type of bonding does this suggest is present in titanium(IV) chloride?

1

b) Titanium(IV) oxide (TiO_2) is used as white pigment in paint.

Calculate the percentage by mass of titanium in TiO_2 .

Space for working and answer

3

10. Calculate the number of moles in each of the following solutions.

a) 250 cm^3 of 2 mol l^{-1} nitric acid.

_____ moles

2

b) 50 cm^3 of 4 mol l^{-1} ethanoic acid.

_____ moles

2

10. Some metals are found uncombined in the Earth's crust but others have to be extracted from their ores.

a) What is meant by the term ore?

1

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

lead, magnesium, mercury

Metal	Method of Extraction
	using heat alone
	using heat and carbon
	electrolysis of molten compound

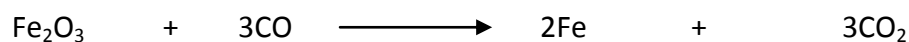
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c) Iron can be extracted by reacting iron(III) oxide with carbon monoxide.

i) Name the type of industrial plant where iron is extracted.

1

ii) The overall reaction taking place during the extraction of iron is given by the equation:



Calculate the mass of iron, in tonnes, which is produced from 1600 tonnes of iron(III) oxide.

Space for working and answer

_____ tonnes

3

Total Marks 37