

**N5 Chemistry**  
**Unit 1: Chemical Changes & Structure**  
**Homework 1.9**

1. Which of the following compounds is a base?

- A Calcium chloride
- B Calcium bromide
- C Calcium oxide
- D Calcium sulfate

Answer \_\_\_\_\_

2.  $4\text{NH}_3 + x\text{O}_2 \rightarrow 4\text{NO} + y\text{H}_2\text{O}$

The equation will be balanced when

- A  $x = 5, y = 6$
- B  $x = 5, y = 10$
- C  $x = 3, y = 6$
- D  $x = 3, y = 10$ .

Answer \_\_\_\_\_

3. What is the name of the compound with the formula  $\text{VO}_2$ ?

- A Vanadium(V) oxide
- B Vanadium(IV) oxide
- C Vanadium(III) oxide
- D Vanadium(II) oxide

Answer \_\_\_\_\_

4. Which of the following compounds is a salt?

- A Magnesium chloride
- B Calcium oxide
- C Hydrogen fluoride
- D Sodium hydroxide

Answer \_\_\_\_\_

5. In a hydrogen fluoride molecule, the atoms share electrons in order to achieve the same electron arrangements as atoms in group

- A 0
- B 1
- C 2
- D 7.

Answer \_\_\_\_\_

6. Which of the following oxides dissolves in water to produce a solution with a pH greater than 7?

- A  $\text{Na}_2\text{O}$
- B  $\text{Al}_2\text{O}_3$
- C  $\text{SO}_2$
- D  $\text{Ag}_2\text{O}$

Answer \_\_\_\_\_

7. Which of the following compounds contains only two elements?

- A Magnesium hydroxide
- B Magnesium phosphate
- C Magnesium sulfite
- D Magnesium nitride

Answer \_\_\_\_\_

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

- A Calcium carbonate and nitric acid
- B Copper oxide and sulfuric acid
- C Copper hydroxide and hydrochloric acid
- D Calcium oxide and sulfuric acid

Answer \_\_\_\_\_

8

9. Give the chemical formula for each of the following compounds.

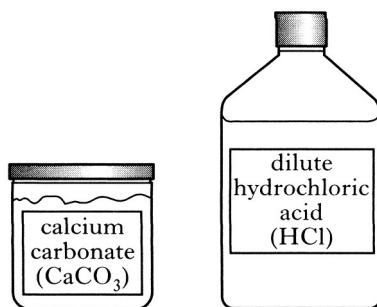
a) Sodium oxide \_\_\_\_\_ d) Copper(II) sulfate \_\_\_\_\_

b) Phosphorus chloride \_\_\_\_\_ e) Zinc(II) phosphate \_\_\_\_\_

c) Aluminium carbonate \_\_\_\_\_ f) Aluminium oxide \_\_\_\_\_

6

10. Calcium carbonate reacts with dilute hydrochloric acid.



a) What type of chemical reaction occurs when calcium carbonate reacts with acid?

\_\_\_\_\_

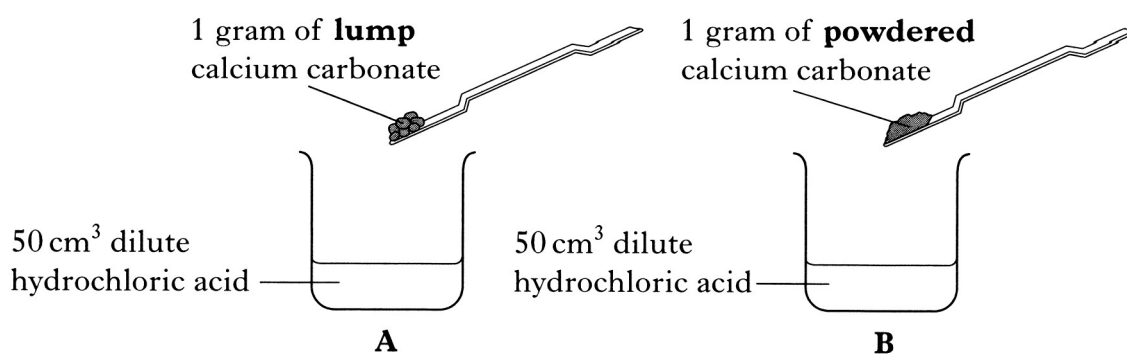
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b) Name the three products of this reaction.

\_\_\_\_\_

2

c) A student carried out two experiments.



i) What will be **seen** in each beaker to show that a reaction was taking place?

\_\_\_\_\_

1

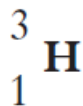
ii) Why will the speed of the reaction be faster in experiment **B**?

\_\_\_\_\_

\_\_\_\_\_

1

11. Tritium is a naturally occurring isotope of hydrogen. It can be represented as



a) Complete the table to show the number of particles in an atom of tritium.

Type of particle	Number of particles
proton	
neutron	
electron	

2

b) Hydrogen has 3 isotopes.

Isotope of hydrogen	Mass number
protium	1
deuterium	2
tritium	3

The relative atomic mass of hydrogen is 1.

Which isotope of hydrogen is the most abundant?

\_\_\_\_\_

1

12. The grid shows some ions.

A $\text{Al}^{3+}$	B $\text{Cl}^-$	C $\text{Li}^+$
D $\text{H}^+$	E $\text{Br}^-$	F $\text{OH}^-$

a) Identify the ion with the same electron arrangement as a helium atom.  
(You may wish to refer to the data booklet.)

Answer \_\_\_\_\_

1

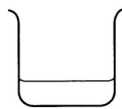
b) Identify the ion present in all alkaline solutions.

Answer \_\_\_\_\_

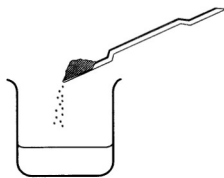
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## WORKCARD

### Preparation of zinc(II) sulfate crystals

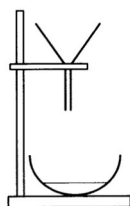


1 Measure 20 cm<sup>3</sup> dilute sulfuric acid into a small beaker.



2 Add one spatulaful of zinc carbonate to the acid and stir.

3 Repeat step 2 until no more gas is given off.



4 Filter your mixture into a clean evaporating basin.



5 Boil the solution for 30 seconds then leave it to cool and crystallise.

a) Name the type of reaction taking place between zinc(II) carbonate and dilute sulfuric acid.

\_\_\_\_\_

1

b) Which gas is produced during this experiment. \_\_\_\_\_

1

c) Give the full **word** equation for this reaction including all three products.

\_\_\_\_\_  
\_\_\_\_\_

1

d) Write a balanced chemical equation for this reaction.

2

e) Why is zinc carbonate added until no more gas is given off?

\_\_\_\_\_

1

Total Marks 30