8.2 Properties of Acids & Bases

Past Exam Questions (Paper 1,2)

1. *[1 mark]*

Which compound reacts with calcium oxide, CaO?

A. K_2O

B. Na_2O

C. SO_2

D. MgO

2. *[1 mark]*

An element, E, is burned in air. A white solid oxide is formed. The oxide is tested with damp red litmus paper and the paper turns blue (alkaline). What is element E.

A. calcium

B. carbon

C. iodine

D. sulfur

3. *[1 mark]*

Substance **K** reacts with sodium carbonate to form a gas. The gas turns limewater cloudy. What is substance is K and which process takes place in the reaction?

	K	process
A	ethanol	combustion
B	ethanol	neutralisation
C	hydrochloric acid	combustion
D	hydrochloric acid	neutralisation

4. *[1 mark]*

Which reaction will result in a decrease in pH?

A. adding calcium hydroxide to acid soil

B. adding citric acid to sodium hydrogen carbonate solution

C. adding sodium chloride to silver nitrate solution

D. adding sodium hydroxide to hydrochloric acid

5. *[1 mark]*

An oxide of element X was added to an acid. It reacted to form a salt and water.

What is the pH of the acid before the reaction and what type of element is X?

	pH	type of element X
A	greater than 7	metal
B	greater than 7	non-metal
C	less than 7	metal
D	less than 7	non-metal

6. *[1 mark]*

An aqueous solution of the organic compound methylamine has a pH greater than 7. Which statement about methylamine is correct?

A. It neutralises an aqueous solution of sodium hydroxide.

B. It reacts with copper(II) carbonate to give carbon dioxide.

C. It reacts with hydrochloric acid to form a salt.

D. It turns blue litmus red.

7. *[1 mark]*

Which is **not** a typical property of an acid?

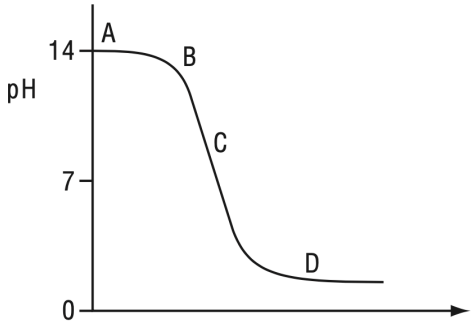
A. They react with alkalis producing water.
B. They react with all metals producing hydrogen.
C. They react with carbonates producing carbon dioxide.
D. They turn litmus paper red.

8. *[1 mark]*

The graph shows how the pH changes as an acid is added to an alkali.

acid + alkali → salt + water

Which letter represents the area of the graph where both acid and salt are present?



9. *[1 mark]*

Carbon dioxide is produced when **X** reacts with ethanol & **Y** reacts with sodium carbonate.

What are X and Y?

	X	Y
A	H_2	HCl
B	H_2	NaOH
C	O_2	HCl
D	O_2	NaOH

10. *[1 mark]*

Ant stings hurt because of the methanoic acid produced by the ant. Which substance could, most safely, be used to neutralise the acid?

	substance	pH
A	baking soda	8
B	car battery acid	1
C	lemon juice	3
D	oven cleaner	14

11. *[1 mark]*

Two indicators, bromophenol blue and Congo red, show the following colours in acidic solutions and in alkaline solutions.

indicator	acid	alkali
bromophenol blue	yellow	blue
Congo red	violet	red

A few drops of each indicator are added to separate samples of a solution of pH 2. What are the colours of the indicators in this solution?

	in a solution of pH 2	
	bromophenol blue is	Congo red is
A	blue	red
B	blue	violet
C	yellow	red
D	yellow	violet

12. *[1 mark]*

Salts can be prepared by reacting a dilute acid with:

I. A metal
II. A base
III. A carbonate

Which methods could be used to prepare copper (II) chloride?

A. I and II
B. I and III
C. II and III
D. I, II and III

13. *[1 mark]*

How many different salts could be made with a supply of dilute H_2SO_4 (aq), dilute HCl (aq), Cu (s), MgO (s) and $ZnCO_3$?

A. 3
B. 4
C. 5
D. 6

14. *[1 mark]*

Which acid reacts with ammonia to produce the salt ammonium sulfate?

A. hydrochloric
B. nitric
C. phosphoric
D. sulfuric

15. *[1 mark]*

Magnesium sulfate is one of the products formed when acid rain reacts with dolomitic limestone. This limestone is a mixture of magnesium carbonate and calcium carbonate.

(i) State the equation for the reaction of sulfuric acid with magnesium carbonate.

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16. *[1 mark]*

25. 0 cm^3 of 0. 200 $mol\,dm^{-3}$ ethanoic acid were added to 30. 0 cm^3 of a 0. 150 $mol\,dm^{-3}$ sodium hydrogencarbonate solution, $NaHCO_3(aq)$.

(i) State an equation for the reaction of ethanoic acid with a solution of sodium hydrogencarbonate.

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