ST ANDREW'S SECONDARY SCHOOL

NAME _____ CLASS _____

DATE _____

CHEMISTRY (G3) **6092**

18.2 Properties and Uses of Ammonia

Assessment for Learning

AMMONIA

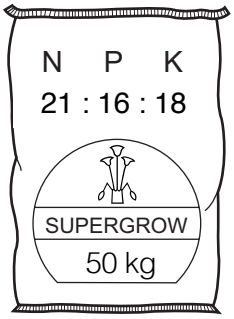
1 Two statements about the bubbling of ammonia in pure water are provided.

Statement 1: pH of the pure water decreases.
Statement 2: Ammonia increases alkalinity.

Which is correct?

A Both statements are correct and statement 2 explains statement 1.
B Both statements are correct but statement 2 does not explain statement 1.
C Statement 1 is correct but statement 2 is incorrect.
D Statement 2 is correct but statement 1 is incorrect.

2 The diagram shows a bag of SUPERGROW fertiliser.



Which combination of chemical compounds would produce the fertiliser?

A $Ca_3(PO_4)_2$, KC*l* and $(NH_4)_2SO_4$
B CH_3CO_2K, $CO(NH_2)_2$ and $Pb(NO_3)_2$
C KH_2PO_4 and NH_4NO_3
D K_2O and $(NH_4)_3PO_4$

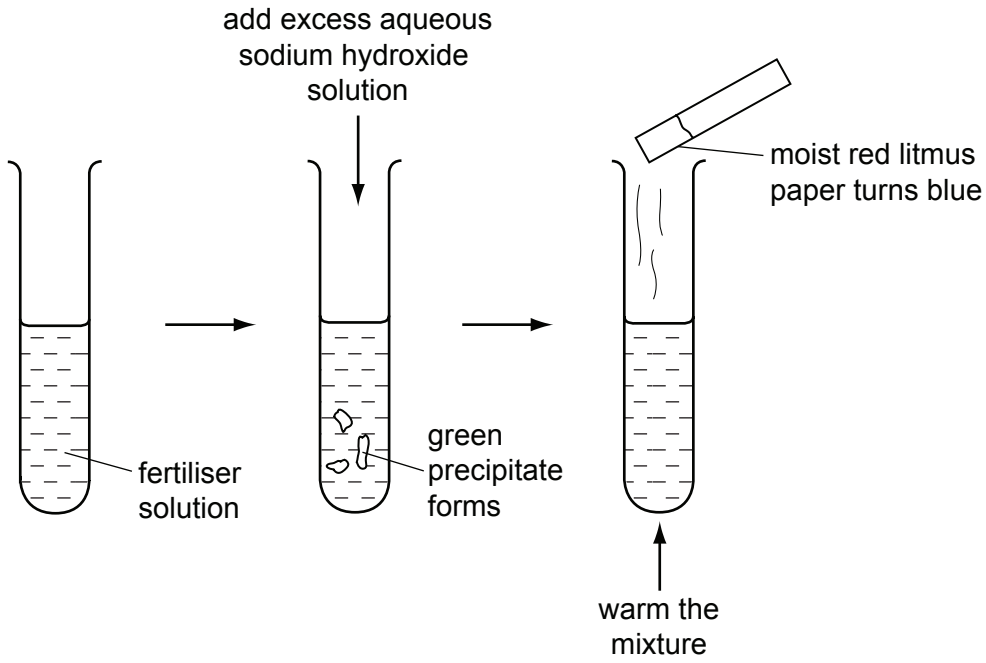
3 One mole of substance X forms three moles of ions in aqueous solution.

Ammonium carbonate reacts with the aqueous solution of substance X to produce an acidic gas.

Which compound could be substance X?

A Ethanoic acid
B Magnesium hydroxide
C Sodium hydroxide
D Sulfuric acid

4 The diagram shows an experiment on the aqueous solution of a fertiliser.



Which pair of ions **must** be present in this fertiliser?

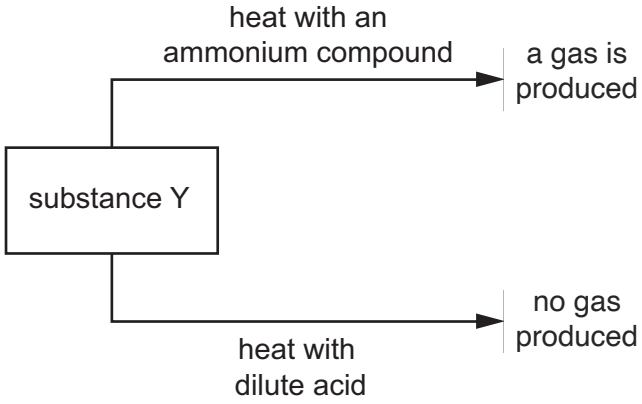
A Fe^{2+} and SO_4^{2-}

B Fe^{3+} and NO_3^-

C NH_4^+ and Fe^{2+}

D NH_4^+ and NO_3^-

5 The diagram shows the reactions of an aqueous solution of substance Y during separate experiments.



Which statement is **not** correct?

A Both reactions are endothermic.

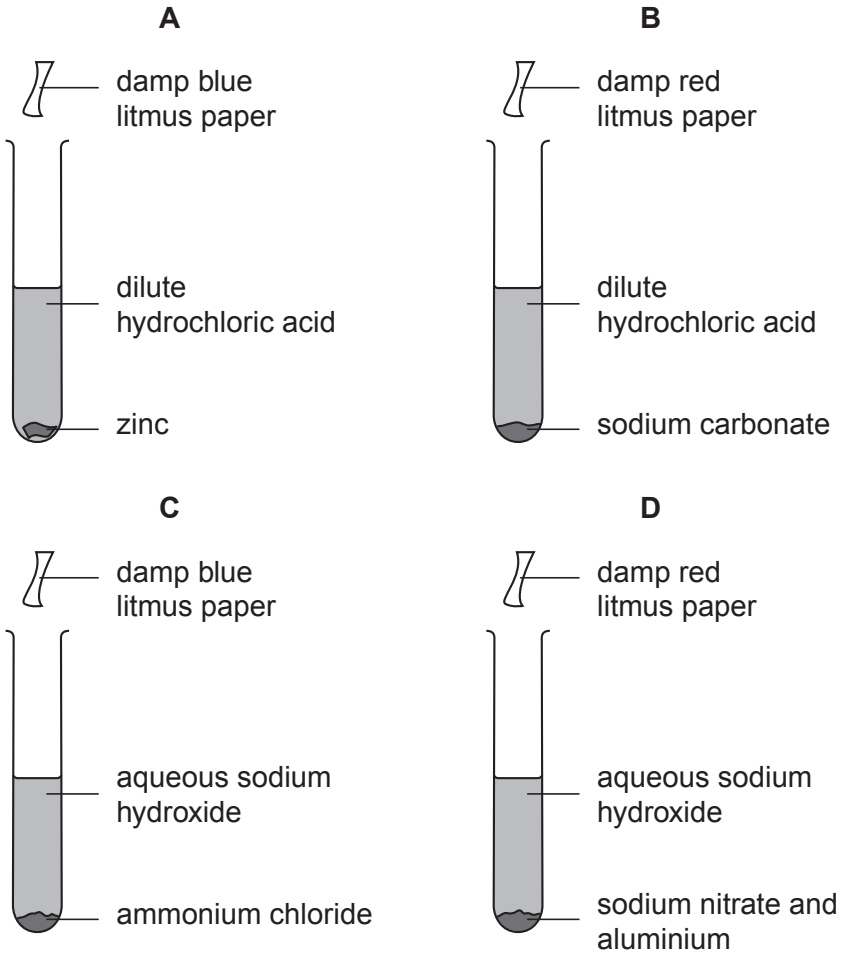
B Neither reaction can be described as a redox reaction.

C Substance Y does not contain carbonate ions.

D The pH of the aqueous solution of substance Y in each experiment changes.

6 The diagrams show different experiments involving the formation of gases.

In which experiment does the litmus paper used change colour?



7 Ammonium nitrate, NH_4NO_3, is a fertiliser used by most farmers today.

Which statement describes an advantage of using NH_4NO_3 as a fertiliser?

A NH_4NO_3 has a high percentage of nitrogen by mass.
B NH_4NO_3 is chemically inert.
C NH_4NO_3 produces ammonia gas readily when reacted.
D Nitrates often leads to eutrophication in large water bodies.

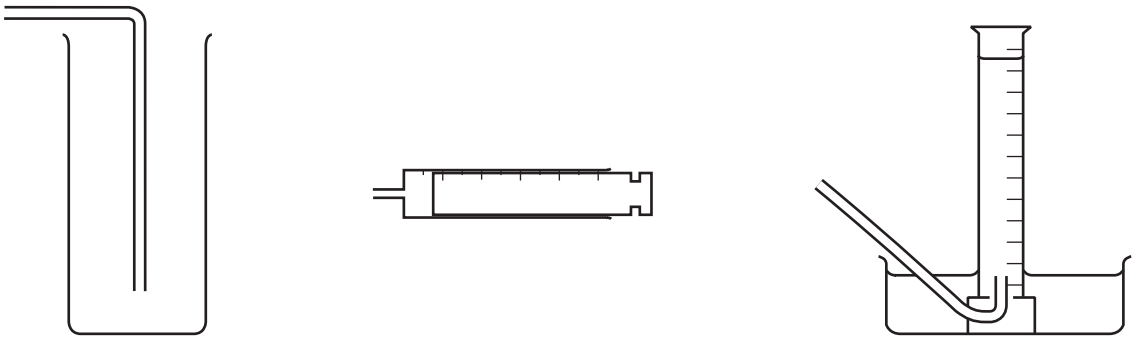
8 In which equation is ammonia shown reacting as a base?

A $NH_3 + CH_2CH_2Br \rightarrow CH_3CH_2NH_2 + HBr$
B $NH_3 + H_2O + CO_2 \rightarrow (NH_4)HCO_3$
C $2\ NH_3 + 2\ Na \rightarrow 2\ NaNH_2 + H_2$
D $4\ NH_3 + 3\ O_2 \rightarrow 2\ N_2 + 6\ H_2O$

9 The objectives of two experiments are listed.

Experiment 1: To measure the time taken to collect 50 cm^3 of ammonia gas.
Experiment 2: To measure the time taken to collect 220 cm^3 of ammonia gas.

The diagrams show three methods of collection of gases.



1 2 3

Which method of collection of gases could be used for each experiment?

	Experiment	
	1	2
A	1, 2 and 3	1, 2 and 3
B	2 and 3 only	2 and 3 only
C	2 only	None of the methods shown
D	None of the methods shown	2 and 3 only

10 Methylamine, CH_3NH_2, has very similar chemical properties to ammonia, NH_3.

The reaction between methylamine and hydrogen chloride forms a white solid, methylammonium chloride.

$$CH_3NH_2 + HCl \rightarrow CH_3NH_3^+ Cl^-$$

A sample of methylammonium chloride is heated with aqueous sodium hydroxide.

What are the products?

A Ammonia and sodium chloride
B Methylamine and sodium chloride
C Methylamine, hydrogen chloride and water
D Methylamine, sodium chloride and water