

Three important uses of Nitric acid and the property of nitric acid involved is:

Question 4

- (a) Explain with the help of a balanced equation, the brown ring test for nitric acid.
- (b) Why is freshly prepared ferrous sulphate solution used for testing the nitrate radical in the brown ring test?

Question 5

From the following list of substances, choose one substance in each case which matches the description given below:

Ammonium nitrate, Calcium hydrogen carbonate, copper carbonate, lead nitrate, potassium nitrate, sodium carbonate, sodium hydrogen carbonate, zinc carbonate.

- (a) A nitrate which gives off only oxygen when heated.
- (b) A nitrate which on heating decomposes into dinitrogen oxide (nitrous oxide) and steam.
- (c) A nitrate which gives off oxygen and nitrogen dioxide when heated.

Question 6

The action of heat on the blue crystalline solid X gives a reddish brown gas Y, a gas which re-lights a glowing splint and leaves a black residue. When gas Z, which has a rotten egg smell, is passed through a solution of X, a black ppt. is formed.

- a. Identify X, Y and Z.
- b. Write the equation for action of heat on X.
- c. Write the equation between solution X and gas Z.

Question 7

X, Y and Z are three crystalline solids which are soluble in water and have common anion.

To help you to identify X, Y and Z you are provided with the following experimental observations. Copy and complete the corresponding inferences in (a) to (f).

- (a) A reddish-brown gas is obtained when X, Y and Z are separately warmed with concentrated sulphuric acid and copper turning added to the mixture.

Inference 1: The common anion is the _____ ion.

- (b) When X is heated, it melts and gives off only one gas which re-lights a glowing splint.

Inference 2: The cation in X is either _____ or _____.

- (c) The action of heat on Y produces a reddish brown gas and yellow residue which fuses with glass of the test tube.

Inference 3: The metal ion present in Y is the _____ ion.

- (d) When Z is heated, it leaves no residue. Warming Z with sodium hydroxide solution liberates a gas which turns moist red litmus paper blue.

Inference 4: Z contains the _____ cation.

- (e) Write the equations for the following reactions:

(1) X and concentrated sulphuric acid (below 200°C). (One equation only for either of the cations given in Inference 2)

(2) Action of heat on Y.

(3) Concentrated nitric acid is added to copper turnings kept in a beaker.

Question 8

a. Dilute nitric acid is generally considered a typical acid except for its reaction with metals. In what way is dilute nitric acid different from other acids when it reacts with metals?

b. Write the equation for the reaction of dilute nitric acid and conc. nitric acid with copper.

Question 9

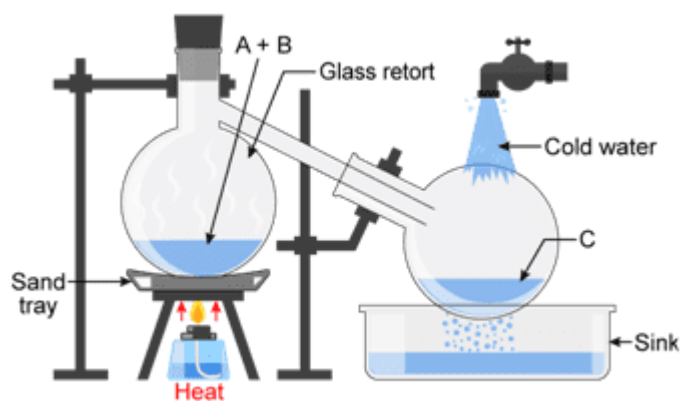
Explain why:

a. Only all-glass apparatus should be used for the preparation of nitric acid by heating concentrated sulphuric acid and potassium nitrate.

b. Nitric acid is kept in a reagent bottle for a long time.

Question 10

The figure given below illustrates the apparatus used in the laboratory preparation of nitric acid.



a. Name A (a liquid), B (a solid) and C (a liquid). (Do not give the formulae).

b. Write an equation to show how nitric acid undergoes decomposition.

c. Write the equation for the reaction in which copper is oxidised by concentrated nitric acid.

Question 11

a. A dilute acid B does not normally give hydrogen when reacted with metals but does give a gas when reacts with copper. Identify B. Write the equation with copper.

b. Complete the table:

Name of Process	Inputs	Equation	Output
	Ammonia + Air		Nitric acid

c. What is the property of nitric acid which allows it to react with copper?

Question 12

a. Name the gas produced when copper reacts with conc. HNO_3 .

- b. State your observation: Zinc nitrate crystals are strongly heated.
- c. Correct the statement: Magnesium reacts with nitric acid to liberate hydrogen gas.
- d. Iron is rendered passive with fuming HNO_3 . Give reason.
- e. Give the balanced equation for dilute nitric acid and copper carbonate.

Question 13

- a. Identify the gas evolved when
 - i. Sulphur is treated with conc. nitric acid.
 - ii. A few crystals of KNO_3 are heated in a hard glass test tube.
- b. State two relevant observations for: Lead nitrate crystals are heated in a hard glass test tube.
- c. Give a balanced equation for: Oxidation of carbon with conc. HNO_3 .

Question 14

- a. Fill in the blank:
Cold dil. nitric acid reacts with copper to form (hydrogen, nitrogen dioxide, nitric oxide).
- b. Give balanced equations for the following:
 - i. Laboratory preparation of nitric acid.
 - ii. Action of heat on a mixture of copper and nitric acid.

Question 15

- (a) Identify **the acid**
 - (i) The acid which is used in the preparation of a non-volatile acid.
 - (ii) The acid which is prepared by catalytic oxidation of ammonia.

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