WORKSHEET 1

CHAPTER 10 – STUDY OF COMPOUNDS – NITRIC ACID

A. Tick (√) the correct option.

1. Who proved that oxygen is present in nitric acid?

   a. Dalton b. Glauber c. Cavendish d. Lavosier

2. Who prepared nitric acid by heating saltpetre in 1658?

   a. Arrhenius b. Glauber c. Cavendish d. Lavosier

3. Who established the composition of nitric acid in 1785?

   a. Faraday b. Glauber c. Cavendish d. Lavosier

4. What is the common name of nitric acid?

   a. Vitriol b. Aqua regia c. Aqua fortis d. Saltpetre

5. What is chile saltpetre?

   a. $NaNO_3$ b. KNO_3 c. $Ca(NO_3)_2$ d. $CuSO_4$

B. Fill in the blanks from the choices given within the brackets.

1. The nitrate which on heating melts and liberates only one neutral gas is _____ [$Pb(NO_3)_2$/$Ca(NO_3)_2$/$NaNO_3$]

2. The reaction of _____ ($CaCO_3$/CaS/CaO) with dilute nitric acid is an example of neutrilisation reaction.

3. Lead nitrate is a/an _____ (normal/acid) salt of nitric acid.

4. The mineral acid obtained from conc. nitric acid on reaction with a non-metal is _____ (HCl/H_2SO_4/H_2CO_3)

5. The oxidised product obtained on reaction with H_2S gas and dil. HNO_3 is _____ (SO_2/S/H_2SO_4)

C. Complete the following equations.

1. _____ + $2HNO_3 \rightarrow Ca(NO_3)_2 + H_2O$

2. _____ + $2HNO_3 \rightarrow Zn(NO_3)_2 + H_2O$

3. _____ + $HNO_3 \rightarrow NaNO_3 + H_2O$

4. _____ + $HNO_3 \rightarrow KNO_3 + H_2O$

5. _____ + $HNO_3 \rightarrow NaNO_3 + H_2O + SO_2\uparrow$

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D. Answer the following.

1. Write a balanced equation for the preparation of nitric acid from potassium nitrate.
2. Name a nitrate of metal which on heating does not give nitrogen dioxide.
3. What is the action of concentrated nitric acid on copper? Write equation.
4. What is the action of heat on sodium nitrate? Write equation.
5. What is the colour of pure nitric acid?

E. The two constituents of water gas can be separated by passing the mixture with extra steam over a heated iron catalyst. One of the gases is oxidized and then is dissolved out under pressure in water (or more easily in aqueous KOH). This gas X can be mixed with one of the gases present in air and then used in the preparation of yet another very important industrial gas. Now answer the following questions.

1. What is the name of the gas X left after this process have been carried out?
2. Name the gas present in air.
3. Name the important industrial gas.
4. What happens when this gas is passed over heated cupric oxide?
5. Write an equation for this.

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ANSWERS

WORKSHEET 1

A. Tick (√) the correct option.

1. d
2. b
3. c
4. c
5. a

B. Fill in the blanks from the choices given within the brackets.

1. $NaNO_3$
2. CaO
3. normal
4. H_2SO_4
5. S

C. Complete the following equations.

1. $CaO + 2HNO_3 \rightarrow Ca(NO_3)_2 + H_2O$
2. $ZnO + 2HNO_3 \rightarrow Zn(NO_3)_2 + H_2O$
3. $NaOH + HNO_3 \rightarrow NaNO_3 + H_2O$
4. $KOH + HNO_3 \rightarrow KNO_3 + H_2O$
5. $NaHSO_3 + HNO_3 \rightarrow NaNO_3 + H_2O + SO_2\uparrow$

D. Answer the following.

1. $KNO_3 + H_2SO_4$ (conc.) $\xrightarrow[200\,^\circ C]{\Delta} KHSO_4 + HNO_3$
2. Sodium nitrate.
3. $Cu + 4HNO_3$ (conc.) $\rightarrow Cu(NO_3)_2 + 2NO_2 + 2H_2O$
4. $2NaNO_3 \xrightarrow{\text{heat}} 2NaNO_2 + O_2$
5. It is colourless.

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E. The two constituents of water gas can be separated by passing the mixture with extra steam over a heated iron catalyst. One of the gases is oxidized and then is dissolved out under pressure in water (or more easily in aqueous KOH). This gas X can be mixed with one of the gases present in air and then used in the preparation of yet another very important industrial gas. Now answer the following questions.

1. X is hydrogen gas.
2. Nitrogen is the gas present in air.
3. Important industrial gas is ammonia.
4. Ammonia reduces copper oxide to copper.
5. $3CuO + 2NH_3 \rightarrow 3Cu + 3H_2O + N_2$

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