WORKSHEET 2

CHAPTER 10 – STUDY OF COMPOUNDS – NITRIC ACID

A. Match the following.

Column A	Column B
1. Reddish-brown fumes evolved and reaction mixture is brown.	Heating of HNO_3 + Cu + H_2SO_4 (conc.)
2. Reddish-brown fumes evolved and reaction mixture is blue.	Heating of conc. HNO_3
3. A brown solution is obtained	Heating of zinc nitrate
4. Reddish-brown fumes evolved and residue is white solid.	Heating of lead nitrate
5. Reddish-brown fumes evolved and residue is yellow solid.	Reaction with acidified $FeSO_4$ + HNO_3

B. Fill in the blanks.

Most of the nitric acid today is manufactured by Ostwald's process. In this process, a mixture of pure dry ammonia and air in the ratio of (1) _____ by volume is first compressed and then passed over (2) _____ at about 900 °C. This results in the oxidation of ammonia into (3) _____ which combines with (4) _____ of the air to give (5) _____ This is an acidic gas from which nitric acid can be obtained by simply dissolving in water.

C. Answer these questions.

1. Name the gas produced by the action of dilute nitric acid on copper.
2. Find the odd one out and explain your choice. Formic acid, nitric acid, acetic acid, propanoic acid.
3. Correct the following statement: Copper reacts with nitric acid to produce nitrogen dioxide.
4. What is the property of nitric acid which allows it to react with copper?
5. Write the equation for the following reaction: Dilute nitric acid and copper.

D. Answer the questions to know the physical properties of nitric acid.

1. What is the colour of commercial nitric acid?
2. What is the odour of nitric acid?
3. What is the taste of nitric acid?
4. What is the density of nitric acid?
5. What is the boiling point of nitric acid?

Name: ..... Teacher's signature: .....

Class: ..... X ..... Date: .....

E. Answer the following.

1. Why does nitric acid stain the skin yellow?
2. What is nitration?
3. How will you identify if the solution of nitric acid is very dilute, dilute or concentrated?
4. Why does nitric acid form only monobasic salts?
5. State any two uses of nitric acid.

ANSWERS

WORKSHEET 2

A. Match the following.

	Column A	Column B
1.	Reddish-brown fumes evolved and reaction mixture is brown.	Heating of conc. HNO_3
2.	Reddish-brown fumes evolved and reaction mixture is blue.	Heating of HNO_3 + Cu + H_2SO_4 (conc.)
3.	A brown solution is obtained	Reaction with acidified $FeSO_4$ + HNO_3
4.	Reddish-brown fumes evolved and residue is white solid.	Heating of zinc nitrate
5.	Reddish-brown fumes evolved and residue is yellow solid.	Heating of lead nitrate

B. Fill in the blanks.

1. 1 : 10
2. platinum
3. nitric oxide
4. oxygen
5. nitrogen dioxide

C. Answer these questions.

1. Nitric oxide
2. Nitric acid (A mineral acid), others are organic acids.
3. Copper reacts with concentrated nitric acid to produce nitrogen dioxide.
4. Oxidizing property
5. $3Cu + 8HNO_3$ (dil.) $\rightarrow 3Cu(NO_3)_2 + 4H_2O + 2NO$

D. Answer the questions to know the physical properties of nitric acid.

1. Commercial nitric acid is usually yellow in colour due to the dissolution of nitrogen dioxide.
2. Choking odour.
3. Being acidic, it is sour in taste.
4. 1.51 g cm^{-3} at 20 °C
5. The pure nitric acid boils at 70 °C.

E. Answer the following.

1. Due to the formation of Xanthoproteic acid.
2. It is the substitution of hydrogen atom from organic compounds by nitro ($-NO_2$) group.
3. i. Dilute nitric acid evolves laughing gas with zinc.
   ii. Conc. nitric acid evolves dense brown nitrogen dioxide gas with copper turnings or zinc.
   iii. Very dilute nitric acid evolves no gas with zinc.
4. It is because it has only one replaceable hydrogen atom.
5. Uses of nitric acid.
   i. It is used as a nitrating agent.
   ii. It is used to prepare explosives.