

## STD 10 CHEMISTRY CHAPTER 5 COMPOUNDS OF NON METALS

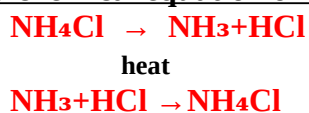
### FIRST BELL CLASS 27 (EM) NOTES AND WORKSHEETS

#### Reversible and Irreversible reactions

#### Experiment No-1: Heating of ammonium chloride

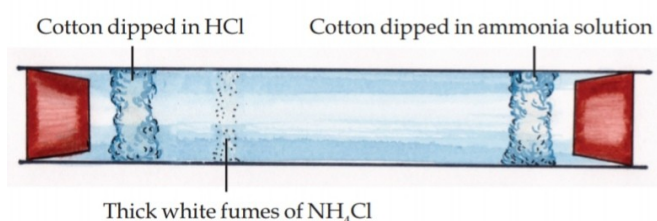
Experiment	Observation	Inference
<ul style="list-style-type: none"><li>● Take some ammonium chloride in a boiling tube and heat it.</li><li>● Show a wet red litmus paper on the mouth of the boiling tube.</li><li>● Observe the inner side of the boiling tube.</li></ul>	<ul style="list-style-type: none"><li>● Smell of ammonia gas is formed.</li><li>● At first the wet red litmus paper changes to blue and then changes to red again.</li><li>● A white powder is sticking to the sides of the boiling tube.</li></ul>	<ul style="list-style-type: none"><li>● On heating a ammonium chloride decomposes to ammonia and HCl gas. <math>\text{NH}_4\text{Cl} \rightarrow \text{NH}_3 + \text{HCl}</math></li><li>● Lighter ammonia comes first and change wet red litmus to blue. Then the denser HCl gas comes out which change blue colour of litmus to red.</li><li>● The white powder is ammonium chloride which is formed by the reaction between ammonia and HCl gases which come out. <math>\text{NH}_3 + \text{HCl} \rightarrow \text{NH}_4\text{Cl}</math></li></ul>

#### Balanced chemical equation of heating of ammonia



#### Experiment No:2

To see first bell class 27 click here



Experiment	Observation	Inference
Take a glass tube. Place a piece of cotton dipped in HCl at one end and another piece dipped in ammonia solution at the other end as shown in the above figure.	Thick white fumes and white powder are formed on the inner wall near the cotton dipped in HCl. When heated this region white fumes and white powder disappear.	Thick white fumes and powder is ammonium chloride formed by the reaction between NH <sub>3</sub> and HCl gas. When heating, NH <sub>4</sub> Cl decomposes to NH <sub>3</sub> and HCl gas.

### Conclusion

From experiments 1 & 2, On heating NH<sub>4</sub>Cl decomposes to NH<sub>3</sub> and HCl gas. The products NH<sub>3</sub> and HCl gas recombine to form the reactant NH<sub>4</sub>Cl. This reaction is known as **reversible reactions**.

Decomposition of NH<sub>4</sub>Cl on heating  $\rightarrow$  NH<sub>4</sub>Cl (s)  $\rightarrow$  NH<sub>3</sub> (g)+HCl (g)

Recombination of products into reactant  $\rightarrow$  NH<sub>3</sub> (g)+HCl (g)  $\rightarrow$  NH<sub>4</sub>Cl (s)

We can combine these two equations by using “ $\rightleftharpoons$ ” (read as reversible)

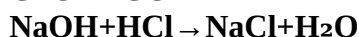
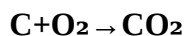


**Reversible reactions** – Reaction taking place in both directions are called reversible reactions.

In a reversible reaction, the reaction in which the reactants change to products is called **forward reaction** and the reaction in which the products change back to reactants is called **backward reaction**.

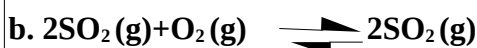
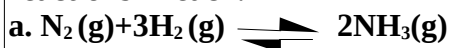


**Irreversible reactions** – The reactions in which reactants give products, but the products do not give back the reactants are called irreversible reactions.



### Worksheet

1. Examine the chemical equations given below and write the forward and backward reactions in each.



2. On heating NH<sub>4</sub>Cl, wet red litmus first changes to blue. Why?

3. In experiment 2, thick white fumes indicates which substance?

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