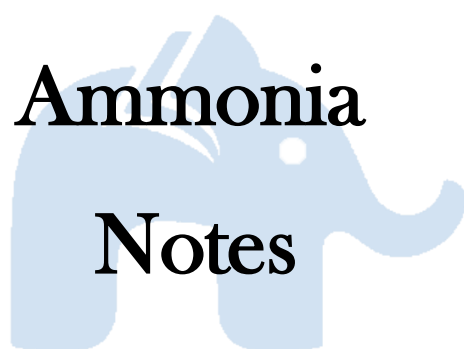


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# **Class 10 - ICSE**

# **CHEMISTRY**

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# Ammonia Notes

### Laboratory preparation of ammonia gas

**Reactants** : Ammonium chloride ( $\text{NH}_4\text{Cl}$ ) and calcium hydroxide [ $\text{Ca}(\text{OH})_2$ ].

(Excess of calcium hydroxide is mixed well with ammonium chloride).

### Procedure:

Reactants (ammonium chloride, and calcium hydroxide in excess) are finely grinded and taken in a round-bottom flask fitted in a slanting position, mouth downwards as known in Fig. 9.1. On heating the mixture, ammonia gas is evolved

**Precautions** : The flask is tilted in such a way that the water formed in the reaction does not trickle back into the heated flask and thus break it.

**Drying of ammonia gas** : In order to get dry ammonia, the gas is passed through a drying tower containing lumps of *quicklime* ( $\text{CaO}$ ).

**Unsuitability of other drying agents** : Other drying agents like cone. sulphuric acid, phosphorous pentoxide and anhydrous calcium chloride are not used, as ammonia being basic, reacts with them.

### Collection:

Ammonia gas is collected in inverted gas jar by the *downward displacement* of air because it is

i) lighter than air (V.D. of  $\text{NH}_3$  8.5; that of  $\text{air}$  14.4), highly soluble in water and therefore, it cannot be collected over water.

**Preparation of aqueous ammonia:**

An aqueous solution of ammonia is prepared dissolving ammonia in water.

**Procedure :** Water is taken in a container and only a small portion of the mouth of the funnel is dipped in water.

As ammonia dissolves in water at a higher rate than its production in the flask, the pressure in the funnel above water level decreases for a moment, and water rushes into the funnel. As a result, the rim of the funnel loses its contact with water. Since, ammonia produced pushes the water down, the funnel comes in contact with water again. In this way, ammonia dissolves in water without back suction of water.

**Fountain Experiment**

To demonstrate the high solubility of ammonia gas in water.

Apparatus:

A round bottomed flask filled with ammonia gas, Mouth of the flask is fitted with a rubber stopper with two holes, one for jet tube and the other for a dropper containing water, A trough containing red litmus solution.

A retort stand is used to fix the round bottomed flask in inverted position.

**Chemical properties of hydrogen chloride gas**

**Thermal dissociation :** Ammonia gas dissociates into nitrogen and hydrogen at high temperature or by electric sparks

**Basic properties :** Dry ammonia is a covalent: molecule. So, it is neutral even in liquefied form .Its aqueous solution is a weak base, the basicity is due to a lone pair of electrons on its nitrogen atom.

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