

# **STUDY MATERIAL**

Subject: Physical Science

Chapter: Ammonia

Part: III

Class: 10

Date: 11<sup>th</sup> April 2020

**Q.20. Cupric hydroxide dissolves in aqueous ammonia due to :**

- (A) reduction to cuprous hydroxide
- (B) complex formation
- (C) increase in pH
- (D) the amphoteric nature of  $\text{Cu}(\text{OH})_2$

Ans. (B) complex formation

**Q.21. The blue complex formed on addition of conc.  $\text{NH}_4\text{OH}$  solution to a  $\text{Cu}^{2+}$  salt solution has the structure :**

- (A)  $[\text{Cu}(\text{NH}_4)_4]^{2+}$
- (B)  $[\text{Cu}(\text{NH}_3)_2]^{2+}$
- (C)  $[\text{Cu}(\text{NH}_3)_4]^{2+}$
- (D)  $[\text{Cu}(\text{NH}_4)_2]^{2+}$

Ans. (C)  $[\text{Cu}(\text{NH}_3)_4]^{2+}$

**Q.22. On addition of  $\text{NH}_4\text{OH}$  to a copper sulphate solution :**

- (A) blue precipitate of copper hydroxide is obtained
- (B) black precipitate of copper oxide is obtained
- (C) a deep blue solution is obtained
- (D) no change is observed

Ans. (C) a deep blue solution is obtained

**Q.23. In which the ammonia is not used ?**

- (A) Cold storage
- (B) Anaesthetic
- (C) Manufacture of rayon and plastic
- (D) None of these.

Ans. (B) Anaesthetic

**Q.24. In the reaction :  $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$ , the catalyst used is :**

- (A) Pt and Cu
- (B) Fe and Mo
- (C) NO + Pt
- (D) Ni + Ti

Ans. (B) Fe and Mo

**Q.25. Ammonia can be obtained by heating ammonium sulphate with :**

- (A) KOH
- (B) NaCl
- (C)  $\text{CaCl}_2$
- (D)  $\text{ZnSO}_4$

Ans. (A) KOH

**Q.26. Ammonia is collected by :**

- (A) downward displacement of water
- (B) downward displacement of air
- (C) upward displacement of air
- (D) by downward displacement of hot water

Ans. (B) downward displacement of air

**Q.27. Ammonia is :**

- (A) basic
- (B) acidic
- (C) neutral
- (D) insoluble in water

Ans. (A) basic



**Q.28. Ammonium chloride and Ca(OH)<sub>2</sub> on heating produce :**

(A) N<sub>2</sub>

(B) NO<sub>2</sub>

(C) NH<sub>3</sub>

(D) NO

Ans. (C) NH<sub>3</sub>

**Q.29. Liquid ammonia contains :**

(A) 35% NH<sub>3</sub>

(B) 60% NH<sub>3</sub>

(C) 80% NH<sub>3</sub>

(D) 0.0% NH<sub>3</sub>

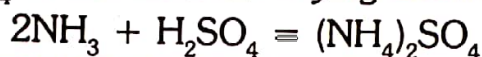
Ans. (A) 35% NH<sub>3</sub>

## B. Short answer type questions

Marks for each 2

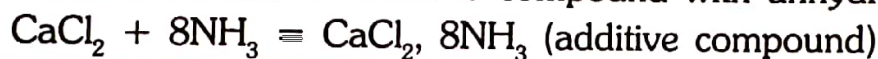
**Q.1. Why is conc. H<sub>2</sub>SO<sub>4</sub> not used for drying ammonia gas ?**

Ans. Ammonia is a basic compound. So it forms salt with conc. H<sub>2</sub>SO<sub>4</sub>. For this reason conc. H<sub>2</sub>SO<sub>4</sub> is not used for drying ammonia gas.



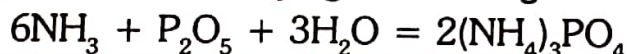
**Q.2. Why is anhydrous CaCl<sub>2</sub> not used for drying ammonia gas ?**

Ans. Ammonia forms an additive compound with anhydrous CaCl<sub>2</sub>.



**Q.3. Why is P<sub>2</sub>O<sub>5</sub> not used for drying ammonia gas ?**

Ans. Ammonia is a basic compound. P<sub>2</sub>O<sub>5</sub> is an acidic oxide. So it forms salt with P<sub>2</sub>O<sub>5</sub>. So P<sub>2</sub>O<sub>5</sub> is not used for drying ammonia gas.



**Q.4. Why CaO is used for drying agent of ammonia ?**

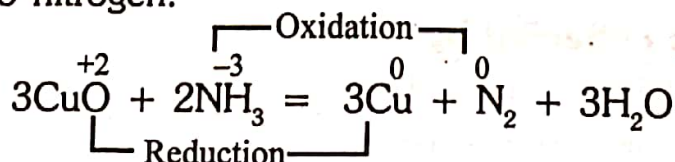
Ans. CaO is used for drying agent of ammonia : Ammonia is a basic compound. It is dried of using a basic drying agent i.e. Quick lime (CaO) which has no action on ammonia.

**Q.5. What is liquor ammonia ?**

Ans. Liquor ammonia : A saturated (35% by weight) aqueous solution of ammonia (sp. gr. = 0.88) is called liquor ammonia.

**Q.6. Prove that ammonia has reducing property.**

Ans. Reducing property of ammonia : When ammonia is passed over strongly heated black cupric oxide which is reduced to red metallic copper and ammonia is oxidised to nitrogen.



**Q.7. State about solubility of ammonia in water.**

Ans. Solubility of ammonia in water : Ammonia is highly soluble in water. One volume of water can dissolve about 1299 volumes ammonia at N.T.P. A concentrated aqueous solution of ammonia is called ammonia.

**Q.8. What are the differences between liquid ammonia and liquor ammonia ?**

Ans. Difference between liquid ammonia and liquor ammonia :

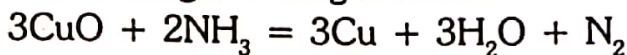
There is a sharp difference between liquid ammonia and liquor ammonia. The



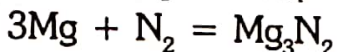
first one is the liquified ammonia gas which has formula  $\text{NH}_3$ , while the second one is the concentrated solution of ammonia which has formula  $\text{NH}_4\text{OH}$ .

**Q.9. How will you prove that ammonia contains nitrogen ?**

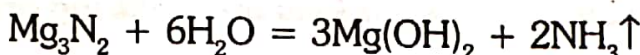
**Ans. Ammonia contains nitrogen :** Ammonia gas when passed over heated cupric oxide produces colourless gas having no smell.



When the colourless gas is passed over heated magnesium, magnesium nitride ( $\text{Mg}_3\text{N}_2$ ), the white powder produces.



When the white powder is boiled with water it will produce pungent smell gas  $\text{NH}_3$ .



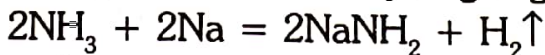
This reaction proves that the colourless gas is nitrogen. This reaction also proves that one of the constituents of ammonia is nitrogen.

**Q.10. What precautions should be taken to combat the effect of ammonia leaked from industries and ammonia tanks ?**

**Ans. Precautions for ammonia:** If accidentally, ammonia gas leaks from industries and ammonia tanks, heavy shower of water should be applied in the atmosphere that is filled with the leaked gas. If at any time, tanks filled with ammonia gas are required to be shifted somewhere, the carrier of tanks must also carry plenty of water that may be used to spray in the air filled with accidental leakage of ammonia gas.

**Q.11. How does ammonia react with sodium ?**

**Ans. Reaction of ammonia with sodium :** Heated sodium metal at  $400^\circ\text{C}$  reacts with ammonia producing sodamide and hydrogen gas.

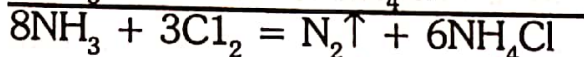
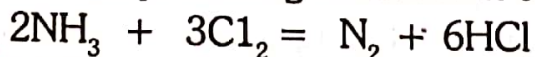


This reaction proves that ammonia contains hydrogen.

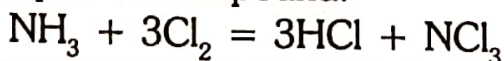
**Q.12. How does ammonia react with chlorine ?**

**Ans. Reaction of ammonia with chlorine :** Ammonia reacts with chlorine in two ways.

(i) **When ammonia is excess :** Excess ammonia is oxidised by chlorine forming nitrogen and is reduced to hydrochloric acid. Hydrochloric acid thus formed combines with ammonia producing ammonium chloride.



(ii) **When chlorine is excess :** When excess chlorine reacts ammonia forming nascent nitrogen which again combines with chlorine producing nitrogen trichloride, an oily yellow explosive compound.



**Q.13. Show with an equation what happens when ammonia is burnt in oxygen.**

**Ans. Ammonia is burnt in oxygen:** Ammonia is neither combustible nor a supporter of combustion. But ammonia burns in presence of oxygen with a greenish yellow flame forming nitrogen and water.

