

TDC Part I
Paper I, Group B
Inorganic Chemistry



Department of Chemistry

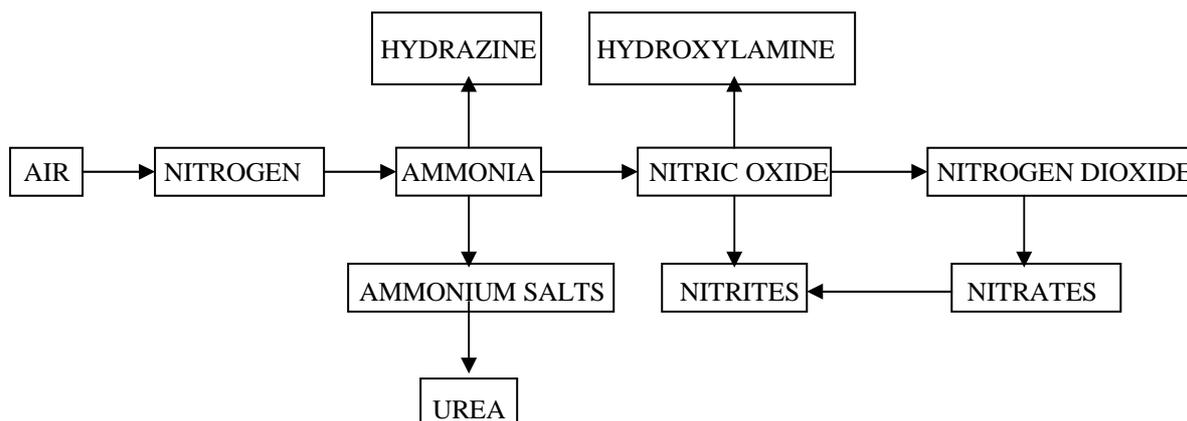
L.S COLLEGE MUZAFFARPUR

B. R. A. BIHAR UNIVERSITY

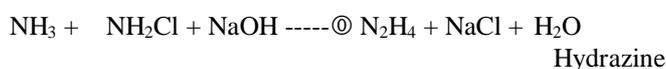
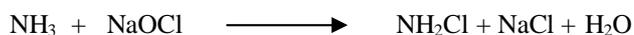
Dr. Priyanka

TOPIC:- Group 15,Compounds,Hydrides

Ammonia is one of the most highly- produced inorganic chemicals. The Haber- Bosch Process manufactures most of it synthetically from nitrogen and hydrogen. A small amount is obtained during coal gas purification and during production of coke from coal. The worldwide production in 2004 was 109,000,000 tons, the chief producer being China followed by India. About 80% or more of the ammonia produced is used for fertilizing agricultural crops. The main fertilizers manufactured from ammonia are urea, ammonium nitrate, ammonium phosphate and ammonium sulphate. Ammonia is also used for the production of many inorganic and organic chemicals, plastics, fibres, explosives and intermediates for dyes and pharmaceuticals. Synthetic ammonia is the key to the production of most nitrogen compounds as shown below.



Hydrazine is prepared by the action of sodium hypochlorite on ammonia in presence of a small amount of glue or gelatin, which suppresses the side reactions:



Side reactions:



Oxidation of hydrazine is highly exothermic

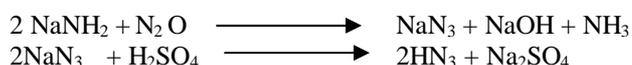


Advantage has been taken of this reaction in the major use of hydrazine and its methyl derivative, in rocket fuels. Hydrazine is a convenient reducing agent. It can also act as a coordinating ligand forming complexes with transition metals. Phosphorous forms an unstable hydride diphosphine, P_2H_4 , which has very little similarity with hydrazine.

Hydrogen azide (hydrazoic acid HN_3) is an unstable compound, which decomposes on heating



It is slightly more stable in aqueous solution and behaves as weak acid forming salts known as azides. Sodium azide is obtained by reaction of sodamide with nitrous oxide.



The acid and some its salts are explosive in nature. Ionic azides are more stable than covalent azides as a greater number of resonating structures can be drawn for the former.

