

MAKING Ammonia

This experiment shows how to produce ammonia in the laboratory.

Calcium hydroxide and ammonium chloride are mixed together and heated. The emerged gas is dried with calcium oxide.

Materials:

- calcium hydroxide ($\text{Ca}(\text{OH})_2$)
- ammonium chloride (NH_4Cl)
- calcium oxide (CaO)
- test tubes
- drying tube
- laboratory burner
- universal indicator
- support

Calcium hydroxide and ammonium chloride were mixed together in a test tube and heated.

The gas which was in the test tube later on was diluted with water.



After heating the mixture in the lower test tube fumes arose. The gas went up into the drying pipe and through the calcium oxide. After that point the gas was invisible.

The gas was diluted with water and the universal indicator turned violet (pH-value 10 or more).

Ammonia, calcium chloride and water is produced.



Ammonium chloride is the salt of a strong acid and a weak base. Calcium hydroxide is a strong base. In the reaction the weak base of the ammonium chloride is replaced by the strong base calcium hydroxide. The newly generated salt calcium chloride (CaCl_2) consists of a strong acid and a strong base and during this reaction the ammonium ion is ported into ammonia which is discharged and H^+ which reacts with the OH^- of the calcium hydroxide to water.

