

4. A student suspected a given sample of water contains sulphate ions. Describe how he can show the presence of the sulphate ions in the water sample. (2mks)

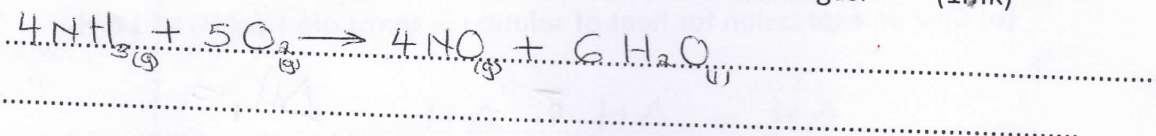
- To the sample, add 2/3 drops of acidified $Ba(NO_3)_2$ / $Pb(NO_3)_2$ solution ✓
- A white ppt is formed. ✓

5. In the industrial manufacture of nitric (v) acid the first step is catalytic oxidation of ammonia gas.

(a) What is the name of the catalyst used. (1mk)

Platinum / Platinum-rhodium

(b) Write the equation for the catalytic oxidation of ammonia gas. (1mk)



(c) State one use nitric acid. (1mk)

Manufacture of nitrogenous fertilizers / Explosives / dyes.
Purification of metals / Etching designs on metals.

6. Explain why boiling point of ethanol is higher than that of dimethylether. (Relative molecular mass of both of them is 46). (2mks)

Molecules of ethanol are held by hydrogen bonds that are stronger than van der Waals that hold molecules of dimethylether.

7. When 94.5g of hydrated barium hydroxide $Ba(OH)_2 \cdot n H_2O$ were heated to a constant mass, 51.3g of anhydrous barium hydroxide were obtained. Determine the value of n. (Ba=137, O=16, H=1) (3mks)

| Compound | $Ba(OH)_2$ | H_2O |
|-------------|------------|--------|
| Mass | 51.3 | 43.2 |
| R.F.M | 171 | 18 |
| No. of mols | 0.3 | 2.4 |
| Mole ratio | 1 | 8 |

n = 8