

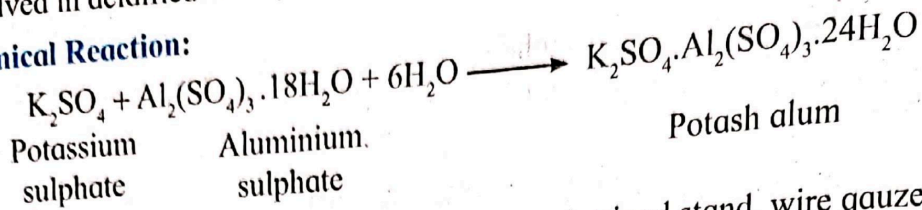
# Experiment No. 12

Date: / /

**Aim:** To prepare a pure sample of potash alum  $[K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O]$ .

**Theory:** An equimolar mixture of potassium sulphate and hydrated aluminum sulphate, when dissolved in acidified water, octahedral crystals of potash alum (a double salt) are obtained.

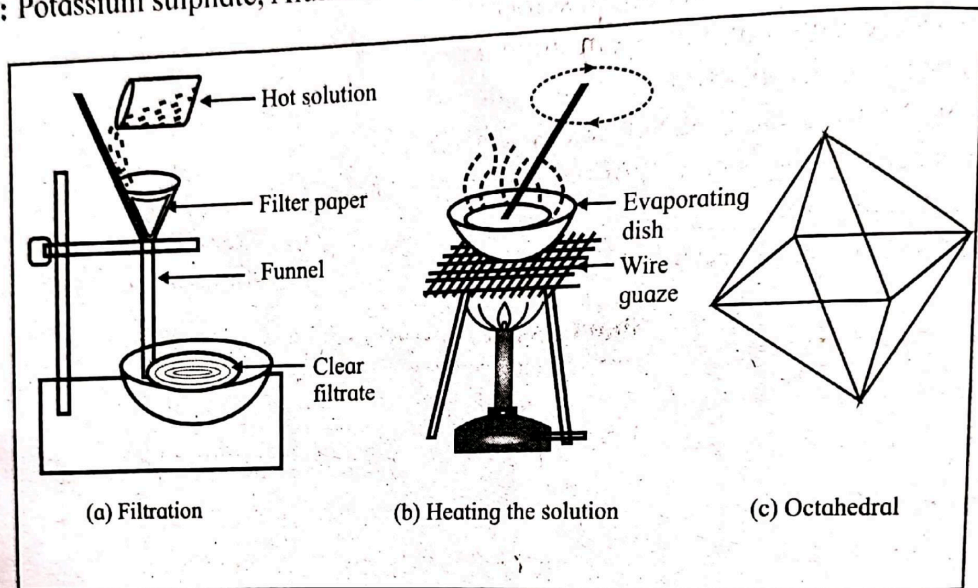
**Chemical Reaction:**



**Apparatus:** Beakers, funnel, China dish, glass rod, tripod stand, wire gauze, etc.

**Chemicals:** Potassium sulphate, Aluminum sulphate, dilute sulphuric acid.

**Diagram:**



**Procedure:**

1. Weigh accurately 1.0 g of potassium sulphate and 4.0 g aluminum sulphate. Transfer it together into 100 mL beaker.
2. Take 20 mL distilled water in another beaker, boil it and add to first beaker containing both salts with constant stirring.
3. Add 2 mL of dilute sulphuric acid and heat the content for about five minutes.
4. If milkiness still persists filter the solution in a china dish.
5. Place the china dish on a wire gauze over the tripod stand and heat the solution with constant stirring till point of crystallisation is reached.
6. Cool the hot solution naturally. Soon crystals of potash alum will separate out.
7. Decant off mother liquor. Filter the crystals if required, wash with ice cold water, dry and weigh the crystals. Shape of potash alum crystal is octahedral.

**Observation and Result:**

1. Colour of potash alum crystals = colourless
2. Shape of potash alum crystals = octahedral
3. Yield of potash alum crystals = 0.03 g

**Remark and sign of teacher:** .....

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Select [✓] the most appropriate answer from given alternatives of each sub question.

1. Water of crystallization present in aluminum sulphate are .....  
 a. 24                      b. 18                      c. 6                      d. 1
2. Shape of potash alum crystal is .....  
 a. monoclinic                       b. octahedral  
 c. cubic                       d. hexagonal
3. Potash alum is .....  
 a. double salt                      b. coordination complex  
 c. 3D complex compound                       d. inorganic base
4. Dilute sulphuric acid is added during preparation of potash alum to  
 a. prevent hydrolysis of aluminum sulphate  
 b. prevent hydrolysis of potassium sulphate  
 c. prevent oxidation of potassium sulphate  
 d. dissolve both the salts  $K_2SO_4$  and  $Al_2(SO_4)_3$ .
5. The process occurs when crystals of potash alum is heated?  
 a. burns the crystals                      b. the crystal melts  
 c. loses the water of crystallization                       d. no change occurs in crystal

**Short answer questions**

1. What is potash alum?

Ans. It is double salt of potassium aluminium sulphate.

2. Write the uses of potash alum.

Ans. for water purification,  
leather tanning, dyeing

3. Why does an aqueous solution of potash alum turn blue litmus red?

Ans. Aqueous solution of potash alum is acidic due to hydrolysis of salt, hence aq. solution of potash alum turn blue litmus red.

4. Differentiate complex compound and a double salt.

Ans. Complex compound have two valency whereas double salt have normal one valency of metal.

**Remark and sign of teacher:** .....