# Preparation of Chromium (III) Potassium Sulfate Dodecahydrate

? Q1/ Give the properties of chromium Alum

Sol/ 1-The formula is $KCr(SO_4)_2.12H_2O$

Its aqueous solution is dark green and turns violet when heated to 50C -2

Soluble in water -3

.Solid Crystalline regular Octahedral with flattened corners -4

The basic idea of preparation chromium alum is oxidation & Reduction according to this -5 -:aquation

$(K_2Cr_2O_7 + 4H_2SO_4 + 3C_2H_5OH \longrightarrow K_2SO_4 + Cr_2(SO_4)_3 + CH_3CHO + 7H_2O$…….(1

Oxidizing agent Reducing agent

$Cr^{+6} \longrightarrow Cr^{+3}$

$(K_2SO_4 + Cr_2(SO_4)_3 + 24H_2O \longrightarrow 2KCr(SO_4)_2.12H_2O$ ……(2

$KCr(SO_4)_2.12H_2O \longrightarrow [K(H_2O)_6]^+ + [Cr(H_2O)_6]^{+3} + SO_4^{-2}$ - 6 decomposition aquation

?Q2/ Compare between Potassium Alum & Chromium Alum

Q3/ Give the reason why we use ethanol or which stap in this preparation change the color ?and why

Sol/ Ethanol is reducing agent , the color change from orang to green by added ethanol…that means ethanol reduce chromium $Cr^{+6}$ by oxidation prosses to chromium $Cr^{+3}$

While potassium dichromate as oxidation agent change ethanol to acetaldehyde by .reduction prosses according to aquations 1,2

?Q3/ Why water bath temperature must be 70C

.Sol/ To prevent solvent (ethanol) from evaporation

?Q4/ Draw the structure of chromium Alum