M.Sc. 4th Semester Examination, 2021

CHEMISTRY

(Inorganic Chemistry Special Practical)

Paper : CHEM 405E (PR)

Course ID : 41465

Time: 2 Hours **Full Marks: 40**

The figures in the right hand side margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

1. Answer *any four* of the following questions: 10×4=40

(a) (i) How do you estimate the nitrate (NO_3^-) of a given nitrate solution using nitron in the laboratory? Can you use the same procedure for the estimation of nitrate in nitric acid solution?

(ii) Write down the structure of nitron and nitron-nitrate salt. (5+2)+3=10

(b) How do you estimate Al^{+3} of a given solution using 8-Hydroxyquinoline in laboratory? Write down the advantages and disadvantages of this method. Draw the structure of the aluminium complex of 8-Hydroxyquinoline. How would you recover the 8-Hydroxyquinoline from the complex? 5+2+2+1=10

(c) Mention the synthetic procedures of cis- and trans-$K[Cr(H_2O)_2(C_2O_4)_2]$ in laboratory. How do you differentiate these two isomers using a chemical method? Write down the structure of these two isomers. 5+2+3=10

(d) Write down the structure of bis-(N, N' disalicylalethylenediamine)-μ-aquadicobalt(II). How do you synthesize this complex in the laboratory? If you take 1 mmole of $CoCl_2$ and an equivalent amount of N, N' disalicylalethylenediamine to synthesize this complex and the percentage of yield of the complex is 58 %, then calculate the yield in grams.

3+5+2=10

(e) How do you prepare salicylaldoxime? Using this how do you estimate Ni^{2+} of a given solution having a small amount of Cu^{2+}? Draw the structure of Ni^{2+} salicylaldoxime complex. 5+3+2 = 10

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(f) (i) How do you synthesize $[Cr(salen)(H_2O)_2]Cl$ and [Ni(salen)] in laboratory?

(ii) Write down the structure of the above mention complexes.

(iii) Describe the laboratory synthetic procedure for tris-(1,2-diaminoethane)chromium(III) chloride using $CrCl_3.6H_2O$ as starting material.

5+2+3=10
