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ICH 451

II Semester M.Sc. Degree Examination, Sept./Oct. 2022
INDUSTRIAL CHEMISTRY
Analytical Chemistry

Time : 3 Hours

Max. Marks : 70

PART – A

1. Answer **any five** questions : **(5×2=10)**
- a) What is Q test ? Write its significance.
 - b) List the advantages of organic precipitating agents in gravimetric analysis.
 - c) Define R_f value and its significance.
 - d) Which are the different colouring agent used in paper chromatography ?
 - e) List the advantages of a potentiometric a titrations.
 - f) Differentiate between fluorescence and phosphorescence.
 - g) How does STM differ from SEM ?
 - h) Mention the uses of differential scanning calorimetry.

PART – B

- Answer **any five** questions : **(5×12=60)**
2. a) What is EDTA ? What are the EDTA titrations ? What type of indicators are used in EDTA titration ? Explain the working of these indicators.
- b) What is meant by preprecipitation from homogeneous solution ? Discuss. **(6+6)**
3. a) Give an account of error and its classification.
- b) What is masking ? List out industrial applications of masking.
- c) Give the name and structure of any two indicators for chelometric titration. **(4+6+2)**

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4. a) What are the different types of column used in gas chromatography ?
b) Explain the instrumentation of GC-MS.
c) Explain the technique of two-dimensional paper chromatography. **(4+4+4)**
5. a) How do you monitor progress of organic reaction using thin layer chromatography ?
b) Explain the instrumentation of LC-MS.
c) Explain the rate theory of chromatographic separation. **(4+4+4)**
6. a) Write a note on cyclic voltammetry.
b) Discuss the theory and instrumentation of turbidimetry.
c) Derive the relation between fluorescence intensity and concentration. **(4+4+4)**
7. a) With a neat sketch, explain the construction and working of spectrofluorometer.
b) Taking suitable example, illustrate the applications of coulometry in various analysis.
c) Explain the various factors affecting the fluorescence phenomenon. **(4+4+4)**
8. a) Write a note on single crystal XRD.
b) Explain the applications of field emission scanning electron microscopy in surface characterization.
c) List the various factors affecting DTA curves. Explain how DTA is useful in analysis of physical mixtures and thermal behaviour of a sample. **(4+4+4)**
9. a) Write a note on atomic absorption spectroscopy.
b) Discuss the principle and applications of scanning tunnelling microscopy.
c) Explain the applications of TGA in determining the purity and thermal stability of a substance. **(4+4+4)**
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