ATRIA INSTITUTE OF TECHNOLOGY
Anandanagar, Bengaluru – 560 024

Department of Basic Sciences Engineering & Humanities

Engineering Chemistry lab

Semester: I and II

IMPORTANCE/BENEFITS:

Chemistry lab accommodates the objective of better understanding of syllabus of 1st year B.E and absorbs the theory along with implementing it practically.

The experiments have been chosen to develop skill among the learners so that they can measure, differentiate and analyse various chemical processes. This will inlay a deep understanding of the subject to help them solve the engineering problems in their area of work.

DEPARTMENT LAB FACILITY:

The department has a well-equipped laboratory with a spacious hall.

Each working table in the laboratory has a granite top, well furnished with reagent racks, pecks for drying glassware, well connected water supply and exhaust facility. It has well designed racks for storing chemicals, lab wares and other accessories.

Interesting facts, safety measures, and other relevant information are displayed in the form of charts. Customized laboratory manual containing experimental protocols facilitate easy reference and aid students to execute the experiments.

Engineering Chemistry Lab incorporates the experiments which involves the volumetric and instrumental techniques for chemical analysis. Students experiment individually. The titrations are also conducted individually by the student.

A BRIEF INTRODUCTION TO PART-A EXPERIMENTS

For example: From PART-A (Instrumental analysis) students would handle a total of 5 experiments, for example;

- **pH meter to estimate the pKa value of given weak acid**.
  The experiment aids them with studying the given unknown weak acid by handling a digital pH meter. It enhances the student's skill of using digital instruments and thus studying any unknown solution.
- **Colorimetric estimation of copper;**

Colorimetry is an experiment in which comparisons of depth of colour of $CuSO_4$ solutions of variable concentration is performed using a colourimeter.

The experiment depends on the making and use of a set of comparison solutions of known copper concentration of the kind and a proper calibration curve is drawn and used.

The experiment helps the students with understanding Beer-Lamberts law and how practically it's been applied, and also the experiment enhances the student's skill of plotting accurate graphs.

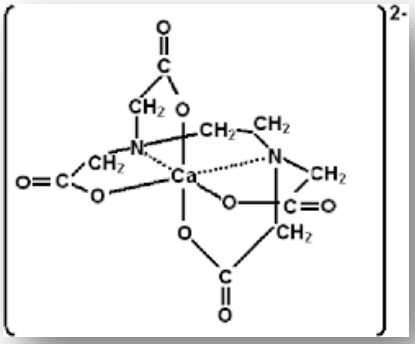
INSTRUMENTS USED:

1. pH meter
2. Potentiometer
3. Conductometer
4. Colorimeter
5. Viscometer

A BRIEF INTRODUCTION TO PART-B EXPERIMENTS:

From PART-B (Volumetric analysis) students handle a total of 5 experiments all of which works on the basis of titrations, majorly includes complexometric, iodometric and redox titrations. For example,

- **Estimate the Calcium oxide content (major component in Cement) in the given cement solution.**
  This experiment helps the students with analysis of basic cement solution. This method is coming under the class of complexometric titration where Calcium ion's present in cement solution forms a strong complex with EDTA (Ethylenediamine tetra acetic acid - Ligand).

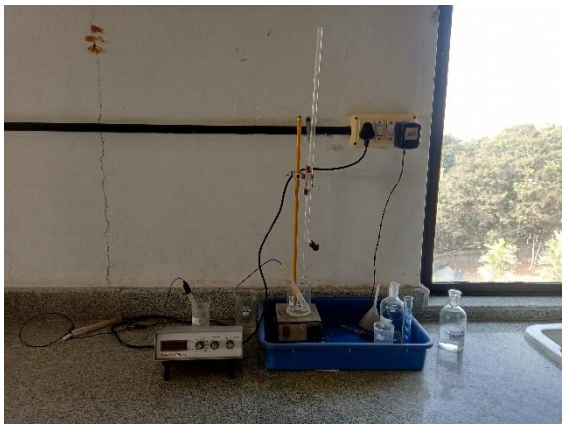


Experiments in Part B:

1. **Determination of total hardness of water using Na_2EDTA (Complexometric titration)**
2. **Determination of calcium oxide in a given sample of cement solution (Rapid EDTA method)**
3. **Determination of percentage of copper in brass using standard sodium thiosulphate solution (Iodometric method)**
4. **Determination of chemical oxygen demand (COD) of the given industrial wastewater sample (Redox method)**
5. **Determination of iron in the given sample of haematite ore solution (External indicator method)**

Photos:

Engg.Chem Lab



pH meter

Colorimeter

Student performing pH meter experiment in Engineering chemistry lab

Student performing Colorimeter experiment in Engineering chemistry lab