CHEMICAL REACTION ENGINEERING LAB

Course Code: 15CH1136

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Course Outcomes :

At the end of the Course, the Student will be able to:

CO 1 Operate lab equipments like CSTR, Batch, PFR reactors.

CO 2 Analyze the concentration versus time data and determine the specific rate constant and the order of the reaction.

CO 3 Compare theoretical and experimental conversions in a CSTR and PFR.

CO 4 Estimate RTD and model parameters in a CSTR and PFR

CO 5 Estimate RTD and model parameters in packed bed and CSTR-in-series.

LIST OF EXPERIMENTS/PROGRAMMES:

1. Determination of specific reaction rate constant and order of a reaction using a batch reactor and analyzing the data by (i) Differential method (ii) Integral method.
2. Determination of the activation energy of a reaction using a batch reactor.
3. To determine the order of the reaction and the rate constant using a tubular reactor.
4. To determine the order of the reaction and the rate constant using a CSTR.
5. To compare experimental and theoretical values of conversion in CSTR in series.
6. To compare experimental and theoretical values of conversion in combination of reactors.

7. Mass transfer with chemical reaction (solid-liquid system) – determination of mass transfer coefficient.
8. Determination of RTD and dispersion number for a packed-bed using a tracer.
9. Determination of RTD and dispersion number in a reactor using a tracer. Major equipment - PFR set up.
10. Determination of RTD and dispersion number in a reactor using a tracer.

    Major equipment – CSTR in series.
11. Determination of RTD and dispersion number in a reactor using a tracer.

    Major equipment - CSTR setup.
12. Determination of RTD and dispersion number in a reactor using a tracer.

    Major equipment – Combination of reactors.