

Alternative Activity 12.1

Description

In this activity the students will use the CSTR simulator to generate kinetics data.

Objective

The objective is for the students to experience the necessary planning and execution of experiments needed for generation of a rate expression. This will hopefully increase their awareness that the problems solved in a kinetics course are highly simplified, especially with respect to the size of the data set. The data generated in this activity could be used for Activities 13.1 and 13.2; in fact, the data provided with those activities are the example results from this activity.

Preparation

Provide the redacted slides to the students and tell them to bring them to class

Make arrangements so the students can run the CSTR simulator from Unit 12 in class (i. e. have them bring laptops or hold class in a computer lab where this is possible)

Lesson Plan

1. Use the first slide to introduce the activity and get the students working on the activity.
2. Allow them 15 minutes to work on generating their data; circulate among them as they work, answering questions and observing what they are doing
3. Call upon a few groups to describe the data set they generated and their reasoning for doing so
 - a. make sure the discussion touches on the three objectives listed on the slide
 - b. ask if anyone can think of a different way to test for reversibility - try to get someone to suggest using a feed that contains only product (simulator won't allow this, but it will allow very low reactant concentrations)
 - c. make sure that the approach includes variation of both the feed composition and the space time
4. Use the second slide to summarize the ways they might have approached the problem.

Variations

Use the batch or PFR simulator in place of the CSTR simulator, or divide the class into thirds and have one third use each of the three simulators.