

Alternative Activity 4.3

Description

In this activity the students will read a kinetics paper from the literature and identify topics presented in Unit 4.

Objective

The objective is to show the students a real-world example of the generation of a rate expression and to have them identify kinetic parameters and kinetic data.

Preparation

1. Assign a paper from the literature and tell the students to read it prior to class. You may want to tell them there will be a quiz on the contents in order to motivate them to do so.
2. You will need to identify a suitable paper; one I have used in the past is S. H. Ali, *Int. J. Chem. Kinetics* **41**(6), 432 (2009).
3. Tell the class to bring a copy of the paper they have read to class.

Lesson Plan

1. Tell the students to take out their copy of the literature paper while you display the first slide.
2. Tell them to follow the instructions on the first slide, working individually.
3. Give them some time to work.
4. Have them form into small groups and compare their responses.
5. Discuss their findings
6. Use the second slide to emphasize that two models are needed when generating rate expressions: reactor model and kinetic model. Point out that if the reactor model is not accurate, the whole process falls apart.

Variations

Have the students comment upon the range of variables studied and how much extrapolation they would feel comfortable with.

Tips and Suggestions

The activity will depend heavily upon the kinetics paper that is used. Interesting results may result if the authors failed to test their reactor design equation or for transport limitations. It will be instructive for them to see exactly what variables constitute the kinetics data set. Similarly, it should be pointed out to them (or discovered by them) that the rate expression contains unknown parameters whose values are found by fitting.