

Alternative Activity 4.1

Description

In this activity a trick quiz is used to reinforce the fact that rate expressions do not necessarily come from the reaction stoichiometry.

Objective

The objective is to help the students realize that rate expressions are derived experimentally.

Lesson Plan

1. Tell the students to take out a paper and pencil and close all other books, notes, etc.
2. Announce that you want to see how well they have mastered the material on rate expressions and to do so you are going to give them 3 minutes to write the rate expressions for as many reactions as they can from the list you will show them.
3. Don't give them time to ask questions, just put up the slide with the reactions and say GO
4. After 3 minutes, say PENCILS DOWN.
5. Tell them to trade papers with their neighbor for grading purposes.
6. Tell them to grade the quizzes their neighbors gave them, and if they have any questions ask someone sitting near them since you forgot the solution key.
7. If it comes out that you can't write a rate expression just by looking at the reaction, conclude the activity by stating that only in special cases is the rate expression related to the stoichiometry, and there's no way of recognizing those special cases without also doing experiments.
8. If no one points out that the expressions can't be written, then continue by asking how many got 1 correct? 2? 3?
9. Ask them how they knew, when grading, that the rate expression was correct since it's impossible to generate the rate expression without doing experiments and you didn't see any of them running a reactor. Discuss further, including points in 7 above.

Variations

Have volunteers come to the board and write each rate expression.

Tips and Suggestions

This activity can bomb badly if someone early on calls your bluff. The point will be made, but it may take much less time than expected, so be prepared with an extra activity in case it does.