

Kinetics Worksheets

Tutorial: Ozone decomposition

Goal: In this tutorial, you will be exploring the relationship between time and concentration during a chemical reaction in order to determine reaction order, rate constants, half-lives, rate laws, and activation energies. If you have not used Excel to create graphs before, you may want to examine the [Making Graphs and Charts in Excel Guide](#).

Instructions -

Open the kinetic data file: OZONE

The kinetic data sets are in Excel 97 format. Each set contains the reaction equation, time and concentration data, and the experimental conditions.

Question 1 (1 point)

Charting relationships: time vs. concentration: ozone

Goal: Comparing the relationship between time and reactant concentration in order to predict characteristics of the resulting graph.

Data treatment: In Excel, choose the spreadsheet for the reaction $2\text{O}_3 \rightarrow 3\text{O}_2$ at 70 °C.

Examine the time and concentration data. If time is on the X axis and concentration is on the Y axis, what do you predict would be the shape of the resulting curve?

1. Sloping upward as time increases
2. Sloping downward as time increases
3. Not changing as time increases
4. First sloping upward then leveling out
5. First sloping downward then sloping upward

Question 2 (1 point)

Charting relationships: time vs. inverse of concentration: ozone

Goal: Comparing the relationship between time and reactant concentration in order to predict characteristics of the resulting graph.

Data treatment:

In the Excel spreadsheet, designate a new column to the right of the concentration column as 1/concentration by labeling it 1/concentration. In the cell below the label, type in =1/B7 and press return. Click on this cell and drag the bottom right corner down to apply this formula to the data in the other cells in column B.

If time is on the X axis and 1/concentration is on the Y axis, what do you predict would be the shape of the resulting curve?

1. Sloping upward as time increases
2. Sloping downward as time increases
3. Not changing as time increases
4. First sloping upward then leveling out
5. First sloping downward then sloping upward