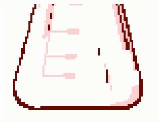
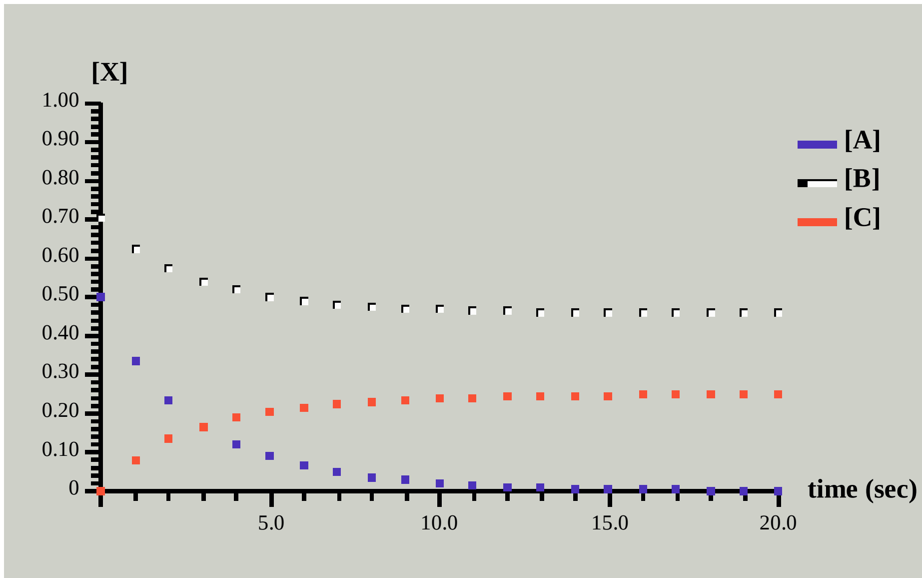
oing on in the flask is based on the equation 2A + B --> C.



Start the reaction

Click graph
for rate
analysis.



Questions to think about after carrying out the reaction:

1. From the graph, how can you tell that the coefficient of A in the chemical equation is not the same as the coefficient of B?

> **A:** The concentrations of A and B both decrease with time, but the concentration of B decreases more slowly than the concentration of A. So their coefficients in the chemical equation for the reaction must not be the same.

2. Click on the point on the graph representing the concentration of A after 2 seconds. The triangle shown on the left represents the rate of change in [A] (slope of the curve, in moles/liter/second) at that time. Is it positive or negative? Why?

> **A:** The rate of change in [A] is negative. That's because A is a reactant. Its concentration is decreasing.

3. Click on the point on the graph representing the concentration of B after 2 seconds. What is the relationship between the initial rate of change in [A] and the initial rate of change in [B] at this time. What does this tell you about the coefficient of B in the chemical equation for this reaction?

> **A:** The rate of change in [B] is the half the rate of change in [A] throughout the reaction. (Both are negative, but the value for A is twice the value for B.) So the coefficient of B in the chemical equation must be half that for A.

4. How can we tell that the reaction is slowing down with time?

A: All the curves initially have steep slopes, but this slope approaches 0 as the reaction proceeds.

Summary points:

1. It is important to distinguish between a chemical *reaction* and the chemical *equation* we use to describe it. The *reaction* involves real or simulated chemicals; the *equation* involves molecular formulas and coefficients.

2. The relative rates of change in concentration of reactants and products in a chemical reaction depend upon their coefficients in the chemical equation we use to describe the reaction.

3. Most reactions slow down as they progress. We could focus on the rate of change at any point in the reaction, but the initial rate of change in concentration is covenient, because the only time we can be sure of the actual concentrations of reactants and products in solution is at the beginning.