NATIONAL CHEMISTRY WEEK

Teacher's Answer Key

What's Happening? Challenge:

Kinetics

The flasks include the same volumes of solution, green food dye and dish soap. The only difference is that the flask on the right of the screen includes 3% hydrogen peroxide and the flask on the left of the screen includes 30% hydrogen peroxide.

The scientist first adds 20 mL of 0.2 M NaI to the flask on the right to catalyze the decomposition of hydrogen peroxide into water and oxygen gas. The reaction proceeds, but slowly. It is apparent that the solution level in the flask rises as gas is created and evolves from the reaction.

In contrast, when the scientist adds 20 mL of 0.2 M NaI to the flask on the left the reaction proceeds faster. From these data, it can be inferred that reaction rates increase with concentration. This is in keeping with collision theory.

Question:

Would you expect the reactions to proceed faster or slower if the hydrogen peroxide solutions were cooled? Describe an experiment you could perform to test your prediction.

Answer:

The reactions should proceed slower if the hydrogen peroxide solutions are cooled because the particles will collide less frequently and with less kinetic energy. In order to test this prediction, we could chill the hydrogen peroxide solutions in a refrigerator or an ice bath for 10-15 minutes prior to carrying out the reactions.

Watch Video

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