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The Overhead Oscillating Clock Worksheet

Discussion Questions

1. Describe what happened in this demonstration.

- 2. This oscillating reaction involves two competing processes in which bromate ions are reduced. The first, Process A, occurs when bromide ion concentration is above a certain level, and the second, Process B, occurs when the same concentration is below a certain level. Write the chemical equation for the following steps in both processes.
 - a. Process A, Part 1. Bromate ions are reduced by bromide ions in the presence of hydrogen molecules.
 - b. Process A, Part 2. Bromine reacts with malonic acid [CH₂(CO₂H)₂].

c.Process B, Part 1. Bromate ions are reduced to bromine by iron(II) ions.

- 3. Write the equation for the overall chemical reaction, in which bromate ions are reduced to bromide ions and malonic acid is oxidized to carbon dioxide and water.
- 4. The Fe(II) complex is red, while the Fe(III) complex is blue. During Process A the solution is red, but during Process B the solution is blue. Knowing this, explain how red, violet, and blue are all produced in the solution.

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