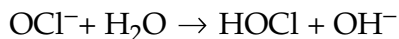


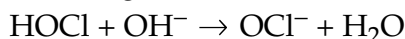
Acids, Bases, and Solutions ▪ *Enrich***Swimming Pool Basics**

If chemicals are not added to swimming pools, tiny organisms such as bacteria and algae can multiply in the water. Algae growth can turn the water in a swimming pool cloudy and make the sides and bottom of the pool slimy. Disease-causing bacteria can make swimmers sick. One chemical added to pools contains hypochlorite ions (OCl^-). A hypochlorite ion reacts with water in the pool to produce hypochlorous acid (HOCl) and a hydroxide ion. Hypochlorous acid kills algae and bacteria. The equation for this reaction is:



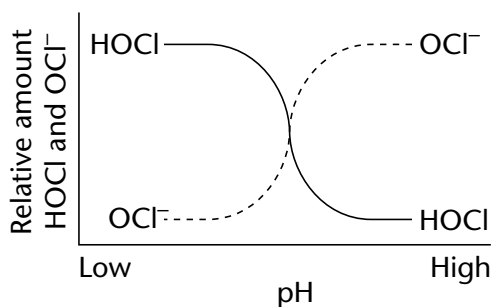
Hypochlorite ion Water Hypochlorous acid Hydroxide ion

The amount of hypochlorous acid that is produced by this reaction depends on the pH of the pool water. The ideal pH for the above reaction is 7.4. Therefore, the pH of the pool water must be carefully controlled. If the pH is too high (above 7.6), the reverse of the reaction shown above occurs:



Hypochlorous acid Hydroxide ion Hypochlorite ion Water

As a result, there will not be enough hypochlorous acid in the pool water to control the bacteria and algae. Problems also occur when the pH of the pool water is too low (less than 7.2). Pool water having a low pH can damage the sides and bottom of the pool. Pool water having pH levels that are either too high or too low can cause eye irritation in swimmers. The graph below shows how the relative amounts of hypochlorous acid and hypochlorite ions vary with the pH of the pool water.



Answer the following questions on a separate sheet of paper.

1. What happens to the amount of hypochlorous acid (HOCl) in a swimming pool as the pH increases? What happens to the amount of hypochlorite ion (OCl^-)?
2. What type of chemical could you add to a swimming pool to decrease the pH of the water? Explain.
3. What type of chemical could you add to a swimming pool to increase the pH of the water? Explain.