

Question #45500, Chemistry, Inorganic Chemistry

What is hardness of water ? Explain its various units and their relationships?

Answer:

Water hardness is called property of water caused by the presence in it of soluble salts of calcium and magnesium.

Hardness of water - this is one of the main criteria for water quality.

The concept of water hardness is usually associated with calcium cations (Ca^{2+}), and to a lesser extent magnesium (Mg^{2+}). In fact, all the divalent cations to varying degrees affect the stiffness. They interact with anions to form compound (hardness salts) are able to precipitate. Monovalent cation (e.g., sodium Na^+) does not possess this property.

The following types of hardness:

Total hardness. Determined by the total concentration of calcium and magnesium ions. Represents the amount of carbonate (time) and uncarbonate (constant) stiffness.

Carbonate hardness. Due to the presence of carbonates and bicarbonates water ($\text{pH} > 8.3$), calcium and magnesium. This type of rigidity almost completely eliminated by boiling water, and is therefore called temporary hardness. When water is heated hydrocarbons decompose to form carbonic acid and precipitation of calcium carbonate and magnesium hydroxide.

Uncarbonate stiffness. Due to the presence of calcium and magnesium salts of strong acids (sulfuric acid, nitric acid, hydrochloric acid) and by boiling persists (constant stiffness).