

# Fast Facts: What is Forchhammer's Principle?



A CTD device

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Forchhammer's Principle refers to the chemical composition of ocean water.

In 1865, the Danish geologist and mineralogist Johan Georg Forchhammer, with the help of naval and civilian collaborators, collected numerous samples of seawater from the Northern Atlantic and the Arctic Ocean. He wanted to determine why the salinity (or "saltiness") of seawater varies in different areas of the ocean.

Forchhammer put the samples through a detailed series of chemical analyses and found that the proportions of the major salts in seawater stay about the same everywhere. This constant ratio is known as Forchhammer's Principle, or the Principle of Constant Proportions. In addition to this principle, Forchhammer is credited with defining the term salinity to mean the concentration of major salts in seawater.

Forchhammer's discovery helped scientists understand that salinity levels in seawater vary due to the addition or removal of fresh water, rather than differing amounts of salt minerals in the

water. The principle is still applied today in marine research, and provides a simple way to estimate salinity and trace the mixing of water masses in the global ocean.

CTD stands for conductivity, temperature and depth, and refers to a package of electronic instruments that measure these properties. The primary function of this tool is to detect how the conductivity and temperature of the water column changes relative to depth. Conductivity is a measure of how well a solution conducts electricity. Conductivity is directly related to salinity, which is the concentration of salt and other inorganic compounds in seawater. Salinity is one of the most basic measurements used by ocean scientists. When combined with temperature data, salinity measurements can be used to determine seawater density, which is a primary driving force for major ocean currents.

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