



Parameter Fact Sheet – Conductivity

The **conductivity** (or **specific conductance**) of an electrolyte solution is a measure of its ability to conduct electricity. The SI unit of conductivity is siemens per meter (S/m).

Conductivity measurements are used routinely in many industrial and environmental applications as a fast, inexpensive and reliable way of measuring the ionic content in a solution. For example, the measurement of product conductivity is a typical way to monitor and continuously trend the performance of water purification systems.

In many cases, conductivity is linked directly to the total dissolved solids (T.D.S.). High quality deionized water has a conductivity of about 5.5 $\mu\text{S/m}$, typical drinking water in the range of 5-50 mS/m, while sea water about 5 S/m (i.e., sea water's conductivity is one million times higher than that of deionized water).

Conductivity is traditionally determined by measuring the AC resistance of the solution between two electrodes. Dilute solutions follow Kohlrausch's Laws of concentration dependence and additivity of ionic contributions. Lars Onsager gave a theoretical explanation of Kohlrausch's law by extending Debye–Hückel theory.