



The Elements of OceanSolution™ Essential Nutrients in Seawater

The ocean is the only source where most of the known elements are in a **perfectly balanced solution**. The following table contains all elements found in seawater that were considered by Dr. Murray to be essential for plant, animal and human health.

Until now, soil and hydroponics growers have normally used fertilizers and nutrient solutions based on only three major elements: nitrogen, phosphorus, and potassium (NPK). More recently, the agricultural and scientific community has begun to recognize the **importance of micronutrients** so that progressive growers utilize up to 16 elements **(in red letters)** in their plant nutrient applications.



However, pure unadulterated **seawater contains 90+ elements** in an inorganic crystalloid solution ready to be absorbed by a plant's roots. And, even though science has yet to prove essential (to good health) all the

elements of the periodic table, sophisticated chemical analysis is slowly beginning to uncover their roles and functions in plant growth, one by one. It is only a matter of time before all the elements will be considered essential or at least beneficial by plant physiologists.

For instance, micronutrients (required by plants in trace amounts) can be described as the catalyst that activate enzymes, and play a specific role in plant growth, development and yield. Dr. Murray found that the relative ratios between the elements remain the same at different levels of concentration – and it is this proper balance in OceanSolution™ that facilitates the optimal nutrient uptake by plants.

SEAWATER: The world's single source of nature's balanced vital elements.

Hydrogen	Nitrogen	Phosphorus
Oxygen	Lithium	Carbon
Helium	Boron	Potassium
Beryllium	Radium	Chromium
Iron	Vanadium	Sulfur
Cobalt	Gallium	Iridium
Nickel	Germanium	Astatine
Copper	Mercury	Rhenium
Zinc	Lead	Tantalum
Titanium	Francium	Thallium
Gold	Palladium	Scandium
Magnesium	Sodium	Holmium
Argon	Yttrium	Arsenic
Ruthenium	Plutonium	Cadmium
Protactinium	Indium	Cerium
Thorium	Tin	Uranium
Actinium	Rhodium	Antimony
Xenon	Tellurium	Technetium
Silver	Iodine	Niobium
Manganese	Molybdenum	Strontium
Platinum	Lanthanum	Neon
Neptunium	Radon	Barium
Cesium	Fluorine	Zirconium
Aluminum	Rubidium	Krypton
Polonium	Bismuth	Neodymium
Silicon	Praseodymium	Promethium
Europium	Samarium	Chlorine
Gadolinium	Terbium	Thulium
Calcium	Erbium	Hafnium
Ytterbium	Dysprosium	Tungsten
Lutetium	Osmium	Selenium
	Bromine	

Source: Chemical Oceanography, Frank J. Millero, 2nd ed, 1996

