

Title of Chapter in Book: Seawater, Composition of

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Abstract: Seawater is a solution of salts of nearly constant composition, dissolved in variable amounts of water. It is denser than fresh water. It is risky to drink seawater because of its high salt content. More water is required to eliminate the salt through excretion than the amount of water that is gained from drinking the seawater. Seawater can be turned into potable water by desalination processes or by diluting it with freshwater. The origin of sea salt is traced to Sir Edmond Halley, who in 1715 proposed that salt and other minerals were carried into the sea by rivers, having been leached out of the ground by rainfall runoff. On reaching the ocean, these salts would be retained and concentrated as the process of evaporation removed the water. There are more than 70 elements dissolved in seawater as ions, but only six make up more than 99 percent of all the dissolved salts; namely, chloride (55.04 weight percent [wt%]), sodium (30.61 wt%), sulphate (7.68 wt%), magnesium (3.69 wt%), calcium (1.16 wt%), and potassium (1.10 wt%). Trace elements in seawater include manganese, lead, gold, and iodine. Biologically important elements such as oxygen, nitrogen, and iron occur in variable concentrations depending on utilization by organisms. Most of the elements occur in parts per million or parts per billion concentrations and are important to some positive and negative biochemical reactions. Properties such as salinity, density, and pH could be used to highlight the composition of seawater.