

Over 97% of the Earth's water is high salinity water in the form of gulfs, oceans, and salt lakes. There is an increasing concern for the quality of water in bays, gulfs, oceans, and other natural waters. These waters are affected by many different sources of contamination. The sources are, but not limited to, groundwater run-off of nitrogen containing fertilizer, pesticides, cleaning agents, solid wastes, industrial waters, and many more. The final destinations of these contaminants are rivers, lakes, and bayous that eventually will lead to bays, gulfs, and oceans. Many industries depend on the quality of these waters, such as the fishing industry. In addition to wild marine life, there are large aquariums and fish and shrimp farms that are required to know the quality of the water. However, the ability of these industries to monitor their processes is limited. Most analytical methods do not apply to the analysis of high salinity waters. They are dependent on wet chemistry techniques, spectrophotometers, and flow analyzers. These methods do not have the accuracy, precision, and sensitivity when compared to ion chromatography (IC). Since the inception of IC, it has become a standard practice for determining the content of many different water samples. Many IC methods are limited in the range of analytes that can be detected, as well as the numerous sample sources of which the methods are applicable. The main focus of current IC methods does not include high salinity waters. This research demonstrates an ion chromatographic method that has the ability to determine low level concentrations of inorganic nitrogen and related anions (nitrite-N, nitrate-N, phosphorous-P, sulfate, bromide, chloride, sulfide, fluoride, ammonia, calcium, and magnesium) in a single run using a combination of UV and conductivity detectors. This method is applicable to various waters, and uses both freshwater and high salinity water samples.