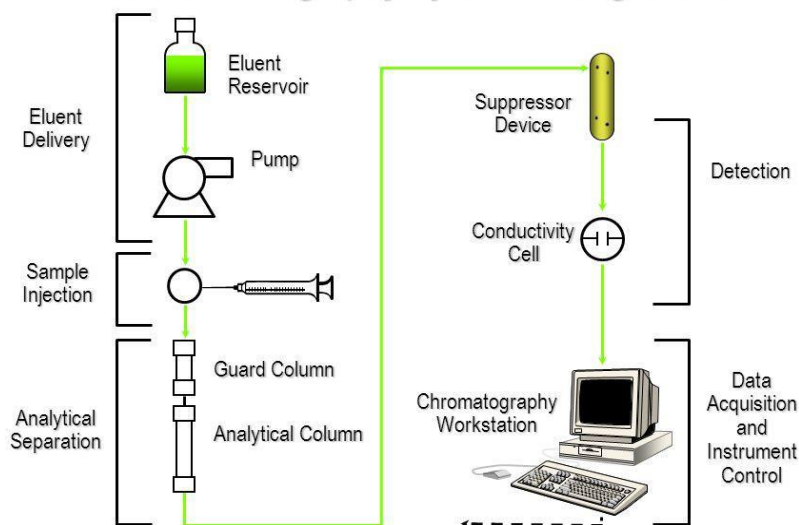


What Is Ion Chromatography?

Ion Chromatography System Configuration

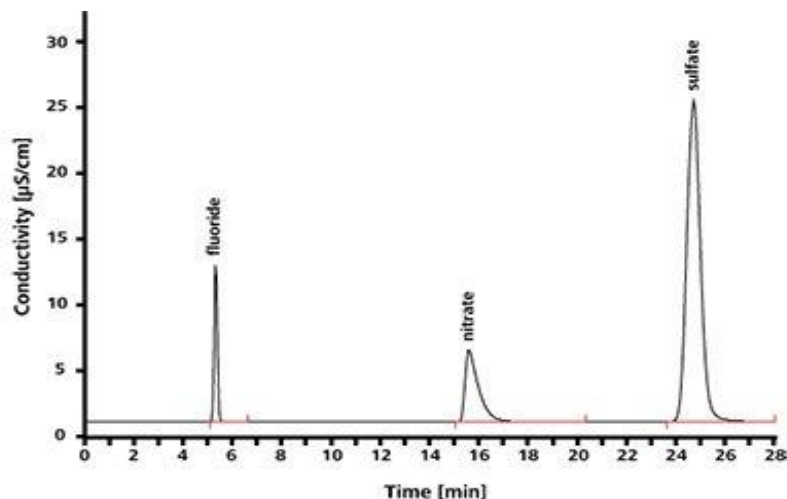


Ion chromatography (IC) is a form of liquid chromatography and is an analytical technique used for the separation and determination of ions in water. The instrumentation components are the pump, injector, suppressor, detector and data station. Ion chromatography, measures concentrations of ionic species by separating them based on their interaction with a resin, very similar to the resin in a water softener. Ionic species separate differently depending on species type and size.

The basic principles of how an ion chromatography instrument works is as follows. A sample of the mixture to be analyzed (called an analyte) is injected into a carrier fluid (called the

eluent). The analyte and eluent combination passes through a column which contains a fixed material called the adsorbent (this is the resin). The ions contained in the analyte are partitioned between the stationary adsorbent and the moving analyte/eluent mixture. The various ions will adhere to the adsorbent to a greater or lesser extent. The ions in the analyte will move down the column at different rates and will separate from one another. The separated ions, pass into a second high-capacity ion-exchange column, termed a “suppressor column,” which removes or suppresses the normally high buffer background conductance to permit detection of trace amounts of the ionic species by electrical conductivity. A detector is used to analyze the output at the end of the column. As the analyte ions leave the column the detector will generate an output of electrical conductivity versus time. This output is reported on a chromatogram as a peak. The peaks on the chromatogram correspond to the different ions contained in the analyte. Ion chromatography can be used for

the detection of many ions. Inorganic anions and cations, ionizable organic species can be determined using this technique.



Example of an Ion Chromatography Chromatogram