

A Study of chemical composition of salts in sea water

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The different compositions in water types serve as the basis for numerous types of industrial processes. The composition is made through the solute, these being the salts, and the solvent, in this case the water. The concentration of dissolved salts varied from 33% to 37% at the surface of the oceans and from 28% to 40% in the coastal regions. The origins of the salts found in water are immense, taking as examples the weathering of the earth's crust and volcanic eruptions. The relationship between water and salts in the oceans is in a state of dynamic equilibrium, which is to say that average speed of evaporation and solubilization of the salts are equal [1].

The amount of salts dissolved in the water may vary between different geographic regions from their individual characteristics, but they maintain their proportions approximately constant in all the oceans. Regions where there is fresh water flow, large continental areas, deeper areas in the ocean and where volcanic material is found in contact with water. Most salts are found in the form of ions and in other cases, because they are not as soluble, they are transported in their solid formula through the sea current [1].

The Table 1 provides the ions and their concentrations and proportions in seawater, in view of the sodium chloride ions that together exceed 80% of the total concentration.

The processes that control the composition of sea water are found in the form of acid-base, oxide-reduction, adsorption and gas solubilization reactions.

In the equatorial region of the terrestrial globe the salinity is lower because the precipitation rate is higher than that of evaporation, different from the tropics where there is salinity increase by the trade winds and because they are centers of high pressures that change the amount of precipitation and evaporation favoring a greater amount of dissolved salts.

Table 1 – Average concentrations of dissolved ions in ocean water.

Ion	Symbol	Concentration g/L	Proportion (%)
Chloride	Cl^{-}	19	55
Sulphate	SO_4^{-2}	2,7	7,7
Bicarbonate	HCO_3^{-2}	0,1	0,3
Bromide	Br^{-}	0,06	0,2
Fluoride	F^{-}	0,001	0,04
Sodium	Na^{+}	10,78	30,6
Magnesium	Mg^{+2}	1,2	3,6
Calcium	Ca^{+2}	0,4	1,1
Potassium	K^{+}	0,4	1,1
Estrontium	Sr^{+2}	0,007	0,02
Carbonate	CO_3^{-2}	0,01	0,04

Salts such as sodium chloride, magnesium chloride, potassium chloride, calcium carbonate, calcium sulfate are the most abundant that give rise to the vast majority of the ions found.

This study was developed to assist the research with the use of nuclear techniques to evaluate the interference of salt concentration in waters used in offshore production. Salinized water is used to maintain reservoir pressure, and its composition may interfere with measurements because of changes in density [2, 3].

References

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