

Emerging Discipline of Marine Chemistry and its Gross Chemical Composition of Sea Water

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Short Communication

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ABOUT THE STUDY

During the early development of oceanography, attention was focused primarily on the biological and physical oceanography, in so far they were related to the existing fishery, with chemical oceanography playing a subordinate role of providing analytical data primarily on salinity, dissolved oxygen and nutrients. At that time, the chemistry of oceans or of the marine environment, in general, was considered a part of physical oceanography and of less important than fisheries oriented research. The paucity of past research in chemistry of oceans all over the world may be largely attributed to the inadequate of even simple and reliable analytical methods available at that time for chemical analysis. This was alleviated by the development of inductive sailnometer for the determination of salinity and in situ devices for the continuous profiling of temperature, dissolved oxygen, nutrients, etc. Rapid advances in technology during and following World War 2 led to the development of sophisticated instrumental methods of chemical analysis. Consequent development and refinement of the methods resulted in coping with the problems unique to ocean chemistry-namely the sensitivity required to determine extremely low concentration levels of trace inorganic and organic constituents of sea water and the high precision required to measure minute variation in concentration of major and minor components.

Marine chemistry or probably chemical oceanography is the study of chemical properties and interactions of substances present in the marine environment. The ocean is a dynamic chemical system which may be visualized as some sort of reaction vessel containing a slightly alkaline, moderately concentrated aqueous solution of both organic constituents in intimate contact with reactive transition metal ions, dissolved oxygen, microorganisms and catalytically active solid phases with the surface exposed to actinic sunlight [1,2].

Further, chemical reactions in ocean are largely determined by phenomena which occur at the air-sea and the water-sediment interfaces. There are several diverse areas of investigations by which marine chemistry or chemical oceanography can claim its right as an emerging discipline.

These include Chemical composition and its variations in sea water, biomass and sediments, Thermodynamics and kinetic aspects of several chemical equilibrium in the sea, Biological utilization of chemical as well as their regeneration in the water column and in sediments, Chemical aspects of pollution and its prevention in marine environment; treatment and disposal of waste [3,4]. Extraction and economic recovery of chemicals, pharmaceutical, minerals, oil and gas, and energy from the sea. Application of radioisotopes in oceanography, and development of reliable new analytical techniques and methods. Sea water is a complex mixture consisting, on average 96.5% of water, 3.5% of salts and a few parts per million organic constituents and particular matter. About 90 naturally occurring elements have so far been identified and evaluated in sea water. The reminders are likely to be detected when more sophisticated and sensitive analytics methods are available. The dissolved components in sea water can be sub-divided into major and minor elements, dissolved gases, nutrients and radioactive nuclides [5,6].

CONCLUSION

Hence, the dissolved fraction also contains several organic constituents. Similar to dissolved components, a wide variety of suspended solids also exist in sea water comprising both inorganic and organic constituents such as clays, minerals, living and dead phyto and zooplankton, bacteria and other organisms. The dissolved and particular fractions can conveniently be distinguished and separated from each other by filtration through a membrane or glass fibre filter having a pore size of 0.45 micrometres. The fraction retained on the filter is designated as particular and that passed through the membrane as dissolved fraction.

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