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Water quality — Determination of total alkalinity in sea water using high precision potentiometric titration

Qualité de l'eau — Détermination de l'alcalinité totale dans l'eau de mer en utilisant une titration potentiométrique de haute précision



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

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Introduction

The greenhouse effect, induced by anthropogenic carbon dioxide, CO₂, in the atmosphere is a serious global environmental issue. A key factor controlling the concentration of atmospheric CO₂ is its absorption into the ocean. Since the volume of ocean water is huge, the change in the oceanic carbonate system from year to year is slight, and it is necessary to measure its components continuously with great precision over a long period. Furthermore, the oceanic carbonate system is related to many components such as water temperature, salinity, dissolved oxygen, and nutrient elements.

The oceanic carbonate system can be depicted by measuring at least two parameters of four: total inorganic carbon; total alkalinity; fugacity of CO₂; and pH of sea water. At the time of publication, it is possible to determine the first two parameters more precisely for subsurface water. Analytical methods for sea water samples, however, require specific conditions and techniques essential to the precise and accurate determination. This International Standard describes a method for the determination of total alkalinity in sea water with an error of less than 0,1 %.

This method is designed to provide international compatibility of accurate data sets on total alkalinity in sea water, which are collected by various communities. Such compatibility is the basis for national and international operational observation and monitoring programs of the oceanic carbonate system, as well as individual research work.