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Review of Salinity Measurement Technology Based on Optical Fiber Sensor

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Abstract: A review of the salinity measurement technology based on the optical fiber sensor is presented. The principles of optical fiber measurement, the structures of probes and the characteristics of various sensing structures are concerned. Firstly, this paper discusses the relationship between the salinity and refractive index, and the effect of ion pairs on the refractive index. Secondly, four methods of direct or non-direct measurements of salinity are summarized, including optical refraction method, optical fiber grating, optical interference and surface plasmon effect. Subsequently, the article compares performances of various sensing structures and analyzes the advantages and disadvantages of different sensors. Finally, a prospect of salinity measurement requirement and the development direction of fiber-optic sensors in this area are addressed.

Keywords: Optical fiber sensor; Salinity measurement; Seawater; Refractive index

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