Desalination and Water Treatment
www.deswater.com

doi: 10.1080/19443994.2013.797629

52 (2014) 3012–3018
April

Taylor & Francis
Taylor & Francis Group

A novel method to estimate the specific gravity and refractive index of seawater

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Received 10 May 2012; Accepted 11 April 2013

ABSTRACT

Seawater is described by a number of physical and chemical parameters that are useful in measurement and analysis of materiel effects. The material dissolved in seawater will not only affect its specific gravity, but also its optical properties, or rather, the degree to which light is refracted as it passes through the sample of water. The specific gravity and refractive index of seawater are related directly to salinity and temperature. In this work, an attempt has been made to develop simple predictive tools to estimate specific gravity and refractive index of seawater as a function of salinity and temperature. Estimations are found to be in excellent agreement with reported data in the literature with average absolute deviation being less than 0.2%.The predictive tool developed in this study can be of immense practical value for engineers to have a quick estimate on the specific gravity and refractive index of seawater without opting for any experimental trials. In particular, process and water treatment engineers would find the proposed method to be user-friendly with transparent calculations involving no complex expressions.

Keywords: Predictive tool; Seawater; Salinity; Refractive index; Specific gravity anomaly

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