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Measuring salinity and TDS of seawater and brine for process and environmental monitoring—which one, when?

Siobhan F.E. Boerlage

GHD, Level 13–The Rocket, 203 Robina Town Centre Drive Robina QLD 4226, Australia
Tel. +61 7 555 7 1022; email: siobhan.boerlage@ghd.com

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ABSTRACT

Seawater and brine salinity in reverse osmosis applications are commonly determined in the desalination industry by the following methods; evaporation, summation of ions or salinity-conductivity relationships. Results from these methods are often abbreviated as "TDS" irrespective of whether the measurement is actually referring to "solids" or "salts". Although, these methods should yield the same result, often they do not. Differences in the results are explained in this paper, following a review of the methods. Examples of seawater and brine salinity determined as salinity and TDS are given highlighting the advantages and limitations associated with each method. Summation of ions yielding Total Dissolved Salts (TDSalts) is recommended for discrete sampling to provide a breakdown of constituent ions for process design and monitoring. While the Practical Salinity Scale (PSS-78) used in oceanography is recommended as the method of choice for both continuous and discrete sampling for process and environmental monitoring. PSS-78 allows consistent measurement of seawater and brine salinity on land and at sea.

Keywords: Desalination; Seawater salinity; SWRO brine salinity; Practical Salinity Scale; TDS; Salinity monitoring

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