Density of Artificial Seawater at High Salinities

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Saline waters are of importance for various large-scale technical processes related to different economic sectors. Natural seawater or brines of similar composition are of inherent relevance, e.g., for the process of carbon dioxide sequestration in geological formations or for the production of potable water and process water.

The improvement of process efficiency and the careful use of resources require knowledge of accurate and consistent thermodynamic and thermophysical properties of seawater and brines as a basis for analysis, design and optimization. The main goal of the present study is to provide data required for the improvement of thermal desalination processes, where temperatures may range up to 120 °C at salinities of up to 70 g/kg.

These temperatures and salinities exceed the range of data and correlations for thermophysical properties commonly used in oceanography. After a brief overview of *p*,V,*T*-data available especially for high absolute salinities, we present densities of artificial seawater and solutions of related composition at high salinities, obtained with a vibrating-tube densimeter.

We will highlight the use of artificial seawater as a technical standard in pilot plant investigations and discuss it against the background of the recently defined IAPSO-Reference Seawater.