



Parameter

USP 645 Water Conductivity, Cell Constant Recalibration

Sample Type

Ultrapure water, water for injection

Introduction

This log describes the process for recalibration of the conductivity cell constant, as required.

Reference

USP <645> Water Conductivity, USP29-NF24, Page 2653, United States Pharmacopeial Convention, 12601 Twinbrook Parkway, Rockville, MD 20852-1790, USA. www.usp.org

Recommended Equipment

5Star benchtop pH/ISE/DO/conductivity meter (Orion 1010152); conductivity electrode (Orion 013016MD) with flow cell (included); printer (Orion 1010006) – optional; Star Navigator Software (Orion 1010007) – optional.

Required Solutions

100 uS/cm conductivity standard (Orion 011008); 1413 uS/cm (0.01M KCl) conductivity standard (Orion 011007); deionized water (DI) of conductivity < 1-2 uS/cm.

Meter Setup

Connect the electrode onto the meter. Set measurement mode to conductivity. In Setup mode, set temperature compensation to off, conductivity cell type to standard, read type to auto, cell constant to 0.100 (nominal), and reference temperature (tREF) to 25.

Electrode Storage, Soaking, and Rinsing

For overnight or longer, store electrodes clean and dry. Soaking in water is acceptable between measurements. Before testing, rinse the electrode thoroughly with DI water and shake off excess water.

Electrode Setup

The cell constant is printed on the conductivity electrode cable. On the meter, press the “calibrate” key and when the cell constant is displayed, press the “digits” key within 5 seconds, before the meter goes into AutoCal mode. Note: do not perform an AutoCal at this time. Using the “scroll” and “digits” keys, adjust the display to match the cell constant from the cable.

Standard Preparation

No standard preparation is required for the Orion 100 uS/cm standard. The conductivity of this standard at any temperature is programmed into the meter.

Dilute 1413 uS/cm (0.01M KCl) standard 1:10 as follows: All glassware must be scrupulously clean and dry. Pipette 10.0 mL of 0.01M KCl into a 100 mL volumetric flask.

Dilute to the mark with DI water of conductivity less than 1-2 uS/cm. This 0.001M KCl standard has a conductivity at 25 +/- 0.2 degrees C of 147 uS/cm.

Recalibration of Cell Constant

If prior corrective actions have failed to bring the cell constant into +/- 2% of the value printed on the cable, recalibrate the probe as follows. Rinse electrode with two portions of 100 uS/cm conductivity standard, shake off excess drops, and then insert the probe into a brand new, freshly opened, previously unused Orion 100 uS/cm standard bottle. Tap the electrode to dislodge any bubbles. Recalibrate the electrode using AutoCal. Record the new cell constant.

Verify the new cell constant one time using the freshly prepared 0.001M KCl standard. Rinse a small beaker with two portions of the 0.001M KCl standard then fill with standard. Rinse the electrode with two portions of the 0.001M KCl standard and place into the beaker. Adjust the temperature of the standard to 25 +/- 0.2 degrees C using a water bath or slightly warm hot plate. The standard should read 147 uS/cm +/- 2% (144 to 150 uS/cm) at 25.0 degrees C. If not, take corrective action. If corrective actions fail, contact our technical service department. See www.thermo.com for updated contact information.

Once the new cell constant has been verified, record the new cell constant on the electrode cable.