

Maintenance of Conductivity electrodes

Cleaning

The single most important requirement of accurate and reproducible results in conductivity measurement is a clean cell. A dirty cell will contaminate the solution and cause the conductivity to change. Grease, oil, fingerprints, and other contaminants on the sensing elements can cause erroneous measurements and sporadic responses.

Cleaning Methods

1. For most applications, hot water with domestic cleaning detergent can be used for cleaning.
2. For lime and other hydroxide containing solutions, clean with a 5-10% solution of hydrochloric acid (HCl).
3. For solutions containing organic fouling agents (fats, oils, etc.), clean probe with acetone. Do not use it for Epoxy body cells.
4. For algae and bacteria containing solutions, clean probe with a bleach containing liquid.

Procedure: Clean the cell by dipping or filling it with the cleaning solution and agitating for two or three minutes.

When a stronger cleaning solution is required, try concentrated hydrochloric acid mixed into 50% isopropanol. Rinse the cell several times with distilled or deionised water and remeasure the cell constant before use.

Storage

It is best to store cells so that the electrodes are immersed in deionised water, possibly enriched with a very small amount of detergent. Any cell that has been stored dry should be soaked in distilled water for 5 to 10 minutes before use to assure complete wetting of the electrodes. Rinse the electrode with distilled water before use.

Some platinum conductivity cells are coated with platinum black before calibration. This coating is extremely important to cell operation, especially in solutions of high conductivity. Electrodes are platinized to avoid errors due to polarization. Cells should be inspected periodically. If the black coating appears to be wearing or flaking off the electrodes or if the cell constant has changed by 50%, the cell should be cleaned and the electrodes replatinised.

Replatinising

This is a method for trained staff.

The platinum electrode should first be cleaned thoroughly in aqua regia being careful not to dissolve the platinum. If the cell remains too long in aqua regia the platinum elements will dissolve completely.

Prepare a solution of 0.025 N HCl with 3% chloroplatinic acid (H_2PtCl_6) and 0.025% lead acetate. Connect the cell to a rheostat or 3-4 V battery to which a variable resistor has been connected. Immerse cell in the chloroplatinic acid solution and electrolyse at 10 mA/cm for 10-15 minutes. Reverse the polarity to the cell every 30 seconds until both electrodes are covered with a thin black layer.

Disconnect the cell and save the platinizing solution. It may be reused many times and should not be discarded as it is expensive to make. Rinse the electrode with tap water for 1 to 2 minutes, followed by distilled or deionized water. Store in distilled or deionized water until ready for use.

