



1 LL Solvotrode

Combined pH electrode for nonaqueous acid-base titrations.

1.1 General

Immediately after receiving the electrode, check to make sure that it works properly. Electrodes that do not work properly must be sent back for warranty processing within 2 months (starting from the day of delivery). If the defect is proven to be due to a material or manufacturing defect, the electrode will be replaced at no charge. Shipping costs are borne by the customer.

Before checking the electrode, condition the glass membrane in water. Allow some electrolyte to flow out. In easy-Clean models, you can achieve this by briefly pressing on the electrode head (5). In other models, you have to loosen the sleeve of the flexible ground-joint diaphragm (4).

The electrode test for the Solvotrode can be performed using the 780/781 pH/Ion Meter or a Titrando with Touch Control or tiamo. Select the electrode type "nonaqueous". These test specifications include an electrode test according to ASTM D 664.

It is also possible to test the Solvotrode according to ASTM D 664 with another pH meter. Measure the potential difference (U/mV mode on your pH meter) between 2 buffer solutions of pH 4 and pH 7. This difference must be at least 162 mV at 25 °C. If the difference is smaller, the electrode must be returned immediately for warranty processing.

1.2 Measuring

Open the closure of the filler opening (3) and refill reference electrolyte up to the filler opening if necessary. Keep the opening open during the measurement. Before and between titration series, store the electrode in distilled water or rinse it with distilled water.

1.3 Electrolyte solutions

The Solvotrode is delivered with saturated LiCl in ethanol as reference electrolyte. However, in certain situations (especially for pH values > 16), other electrolyte solutions are more suitable. For alkaline titrants, we recommend TEABr 0.4 mol/L in ethylene glycol (TEABr = tetraethylammonium bromide). For acidic titrants, we recommend LiCl 2 mol/L in ethanol.

Electrolyte	Order no.
Saturated LiCl in ethanol	Ask your Metrohm representative
LiCl 2 mol/L in ethanol	Ask your Metrohm representative
TEABr 0.4 mol/L in ethylene glycol	6.2320.000

1.4 Storing

Immerse the electrode deeper than the ground-joint diaphragm (**4**, **6**) into the electrolyte that is used as reference electrolyte and close the filler opening (**3**). The electrode may not be stored dry under any circumstances.

1.5 Care



CAUTION

The Solvotrode must not be filled with LiClO₄ in glacial acetic acid. This electrolyte corrodes the electrode head and causes a short circuit.



CAUTION

Never treat electrodes in ultrasonic baths, as they may be damaged by such a treatment.

To change the electrolyte solution in easyClean models, simply press on the electrode head (**5**). In other models, you can open the flexible ground-joint diaphragm (**4**) or empty the electrode using a plastic pipette. Rinse the inner electrode body thoroughly with the new electrolyte and fill the electrode with this solution up to the filler opening. Store the electrode overnight in this solution. Afterwards, the Solvotrode can be used as usual.

Further information on this topic and titration conditions can be found in our monograph "Nonaqueous titration of acids and bases using potentiometric endpoint indication".

Flexible ground-joint diaphragm – limited resistance

The flexible ground-joint diaphragm (**4**) is made of PCTFE and therefore has only limited resistance against the following solvents: ether, benzene, chloroform, diethylamine, dichloroisopropyl ether, xylene, Freon, carbon tetrachloride, methyl chloroacetate, THF, thionyl chloride.

iTrode models

The memory chip that is integrated in the electrode head (**2**) enables the storage of important sensor data such as article number, serial number, calibration data and calibration history.

When the electrode is not in use, screw the protective cap (**1**) onto the electrode head to prevent contamination (water, solvent, dust, etc.) of the electrode head as well as exposure of the contact pins.

1.6 Troubleshooting



NOTICE

There are 2 ways to loosen a jammed diaphragm:

- Immerse the electrode in hot water of up to 70 °C. Optionally, add some dishwashing detergent to the water.
- Immerse the electrode in a cup filled with cola overnight.

Sluggish measured value setting: Place the electrode in distilled water between titrations so that that the membrane but not the diaphragm is immersed in the water. The gel layer of the membrane will recover as a result and the response time of the electrode will improve again.

Contamination of the ground-joint diaphragm: Rinse the diaphragm by allowing a certain amount of electrolyte solution to flow out: Press on the electrode head for easyClean models; in other models, loosen the flexible ground-joint diaphragm. The corresponding amount of electrolyte solution has to be refilled. This procedure should be carried out regularly. This ensures a proper electrolyte outflow during the measurement.

When contaminated with oil products, clean the electrode thoroughly with a suitable solvent between measurements and before storage. Afterwards rinse the electrode with ethanol and then with water.