Instructions for regeneration of pH-sensitive glass

Even electrodes that have been well maintained and properly stored may start performing poorly after some time. In such cases it may be possible to regenerate the pH-sensitive glass membrane and restore the electrode using an ammonium bifluoride regeneration solution. This regeneration solution is based on a highly diluted solution of hydrofluoric acid (HF) which etches away a very thin layer of the glass membrane, exposing a fresh surface area.

This regeneration solution can be ordered from METTLER TOLEDO under part number 51350104 (bottle of 25 mL).

It is absolutely necessary to wear suitable and adequate protection: protective glasses/goggles, laboratory overall, chemical-resistant gloves.

For the material safety data sheet please visit www.mt.com/msds.

Procedure:

- Rinse the electrode with water and dab off the remaining water with a soft tissue until dry.
- Pour the regeneration solution into a HF resistant vessel of suitable size (for optimizing volume). Maximum immersion level is the upper shoulder of the pH-sensitive glass.

maximum
filling level
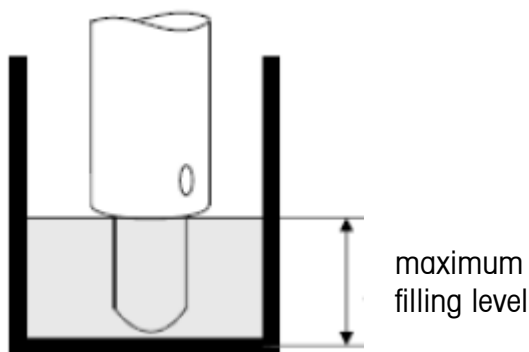
- Dip the electrode into the vessel

    - up to 2 minutes for U glass membrane type[1]
    - up to 15 minutes for A41, LoT, HA, or HF glass type[1]

- Afterwards, rinse the electrode well with water and condition for about 1 hour in buffer solution pH 7.
- Place the electrode overnight (approx. 12 hours) in the reference electrolyte or storage solution[2] specific to the electrode.
- Check again the electrode with a normal calibration.

Hints:

- Do not immerse the electrode for longer duration than recommended else the whole pH-sensitive membrane will be corroded away and the electrode rendered useless.
- Never dip the electrode shaft into the regeneration solution or it gets also etched and becomes cloudy.

If there is no sign of improvement regarding the symptoms, then other causes must be considered[3] or the electrode must be replaced.
The expected lifetime of a correctly used and maintained pH electrode is around one to three years. Factors that contribute to a reduction of the lifetime of an electrode include high temperatures, high frequency of measurements and measuring at extreme pH values.

[1] To find out which type of membrane glass is used in the electrode, refer to the electrode brochure or the specifications available on www.mt.com/electrodes.

[2] The reference electrolyte or storage solution to be used is printed on the shaft of the electrode (if refillable), mentioned in the electrode manual and the electrode brochure as well as on www.mt.com/electrodes.

[3] Further hints to optimize the electrode's condition are available at www.electrodes.net. Start the Electrode ValueBox and choose the pH TroubleShooter.

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