

METTLER TOLEDO APPLICATION NOTE

pH Measurement In Blood Plasma Fractionation

BACKGROUND

The most widely used method for the production of plasma fractions from human blood, especially in the cases of albumin and γ -globulin, are modifications of the Cohn ethanol precipitation method. The different fractions are selectively precipitated at well defined process parameters such as temperature, alcohol concentration and pH value. One of the most influential parameters with respect to purity and yield is the pH value.

THE PROCESS

pH measurement in blood plasma is difficult due to contamination of the diaphragm with precipitated proteins. Also the low measuring temperature as well as the high ethanol concentration (up to 40%) require the use of a special pH electrode. Due to the required precision of the pH measurement ($\pm 0.03\text{pH}$), a pH electrode with a small zero point shift is needed.

INSTRUMENTATION

With these demanding process conditions, the most suitable pH electrode is the InPro[®] 2000 with Friscolyt electrolyte. This liquid filled sensor has an integral RTD for higher measurement accuracy and an IP67 rated quick connect VarioPin connector. This particularly rugged electrode ensures reliable pH measurements even under harsh process conditions. There are several mounting options. For top mounting in tanks the InFit[®] 763 is preferred, while either the InFit[®] 764-50 CIP or retractable InTrac[®] 776-SL is recommended for side mounting. The 2100 pH analyzer is compatible with all Mettler-Toledo pH sensors, including the InPro 2000.

Calibration

The measuring assembly should be calibrated weekly with buffer solutions pH 4, 7 and/ or 10.

Maintenance

After use, the pH sensor should be rinsed with distilled water and stored in METTLER TOLEDO electrolyte FRISCOLYT-B.[™] Special cleaning using METTLER TOLEDO pH Electrode Cleaner and Ceramic Diaphragm Cleaner is necessary only if the electrode becomes covered with a dry layer of plasma.

PRODUCTS

2100 pH Analyzer

- Detachable front panel and plug-in terminals for ease of installation
- All functions accessible through the keypad for increased ease of use
- Continuous sensor and transmitter diagnostics to monitor performance
- FM certification for Class I, Div 1 & 2 Environments and CSA General Purpose Approval
- 3 year warranty

InPro® 2000 Combination pH Electrode

- Refillable for increased electrode lifetime and reduced maintenance
- Liquid-fill design ensures fast response, highest accuracy and reliability
- Silver ion trap to minimize electrode contamination
- Integral RTD for higher measurement accuracy
- Rugged IP67 rated quick connect VarioPin connector

InFit® 763 Insertion Housing

- For vertical installation of pH and redox sensors in reactors
- Various insertion lengths and process connections available
- Wide range of flanges available for flexibility of process installation
- In-situ sterilizable for hygienic applications

InFit® 764-50CIP Stationary Housing

- For highest standards of hygiene
- EHEDG and 3A Certificate for CIP Applications
- Ease of installation provides reduced maintenance
- In-situ sterilizable for hygienic applications

InTrac® 776-SL Retractable Housing

- Rugged 316L SS or PVDF construction for maximum chemical resistance
- Flushing chamber for automatic cleaning and calibration reduces overall system downtime
- Patented immersion tube design isolates the sensor on retraction and guarantees complete separation of the process from the outside environment.
- Safety interlocks prevent sensor removal from housing while in measuring position
- Manual or pneumatic operation