

METTLER TOLEDO APPLICATION NOTE

pH Control In Starch Slurry

BACKGROUND

Acid or base modification of cornstarch is used to obtain semi-finished products for the glue industry, paper industry, and the packing industry. With the proper pH control system, better production control is possible, no production stoppage is required, reduced maintenance is realized and sensor life is extended.

THE PROCESS

Duration of the batch process is 8 hours under the following conditions:

- pH control: using HCl and NaOH
- pH range: acid modification 2 to 7 pH
base modification 7 to 11 pH
- Process temperature: 113 to 122 °F
- Pressure: slightly under pressure
- Viscosity: High
- Vessel Material: Polypropylene or special duplex steel (high chlorine content)
- Batch cleaning: with high pressure tap water (122 °F)

This application typically requires high sensor maintenance. Manual cleaning every hour and short calibration intervals are common due to drifting signals caused by unstable reference potentials.

INSTRUMENTATION

To reduce the high maintenance demands and provide longer sensor life and more accurate results, the Mettler Toledo solution is the Model 465-SC pH electrode with the InTrac[®] 776-SL retractable housing. The 465-SC pH electrode is durable and proven to withstand even the harshest conditions. Choice of refillable electrolyte provides for maximum chemical compatibility and longer electrode life. The pressurizable housing ensures electrolyte outflow to reduce unstable reference potential and increase measurement accuracy. The InTrac 776-SL retractable housing allows users to retract sensors from the process without process interruption for routine maintenance. Manual or automatic cleaning using the patented flushing chamber is also possible. The analyzer recommended for this application is the Model 2100 pH analyzer.

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

465-SC Combination pH Electrode

- Liquid electrolyte provides accurate and precise pH measurements
- Silver ion barrier minimizes diaphragm contamination
- Highly accurate and reproducible results in contaminated processes
- Choice of electrolyte solution ensures chemical compatibility

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