

METTLER-TOLEDO PROCESS APPLICATION

In-Line O₂ Measurement In Hexane, Styrene, And Xylene

BACKGROUND

Hexane, xylene and styrene are used in the production of polypropylene, polyethylene, polystyrene and other polymers. If oxygen is present in hexane, xylene or styrene, the polymerization process will be affected by catalyst poisoning and unwanted side reactions. In-line oxygen systems will improve the quality of product and identify potential problems during the process.

THE PROCESS

To eliminate grab sample methods and reduce operator costs, customers need an in-line measurement system to monitor the oxygen content in the three basic chemicals (hexane, styrene and xylene).

Typical process conditions are:

Process Temperature: 50 to 95 °F
Process Pressure: 15 psi gauge
Measuring point: transfer line (slipstream)
Measuring Ranges:
 Styrene/hexane: less than 2% oxygen
 Hexane: less than 1ppm

Typical calibrations are:

Slope (high end): air
Zero: helium bubbled through styrene or xylene, and nitrogen through hexane
Set-up: styrene and hexane % O₂, hexane ppm

The Mettler-Toledo in-line system correlated well with the headspace analyzer used for grab samples. Response time was less than one minute. Membrane lifetime in hexane was four to six months.

Calibration intervals:

In Styrene & Hexane: every two weeks
In Hexane: every two months

INSTRUMENTATION

The in-line system for this application consists of the 12 x 120 mm sensor with Teflon® ("T") membrane housed in the InFit® 761, and the 4100 Dissolved Oxygen Analyzer. This system provides real-time monitoring of oxygen, allowing the transfer line to be stopped before the product is completely transferred upon upset conditions and resulting in overall increased savings.

REFERENCES

Amoco Chemicals Co.
2800 FM 519 East
Texas City, TX 77592

Amoco Chemicals Co.
1500 North South Street
Pasadena, TX 77501

Mobil Chemical
Gulf State Road
Beaumont, TX

PRODUCTS

4100 Dissolved Oxygen 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

Ingold® 12mm Dissolved Oxygen Sensor

- Steam-sterilizable & autoclavable for hygienic and CIP/SIP applications
- Choice of three membrane styles to suit any application
- Superior anode/ cathode construction extends sensor life
- Rugged construction stands up to repeated sterilizations, reducing replacement costs

InFit® 761 Stationary Housing

- For vertical or side mounting in bioreactors and pipes
- Wide range of process connections and materials of construction to meet most application requirements
- Steam-sterilizable & autoclavable for hygienic and CIP/SIP applications
- Optional integral cage shields the sensing membrane from accidental breakage