

On-Line Monitoring of Chlorine Purity

Chlorine is a 'workhorse chemical' that is used in many industrial processes. The most common industrial use of chlorine is the manufacture of polyvinyl chloride (PVC). Chlorine is also used to make polyurethane, water treatment chemicals and solvents.

Measurement Requirement

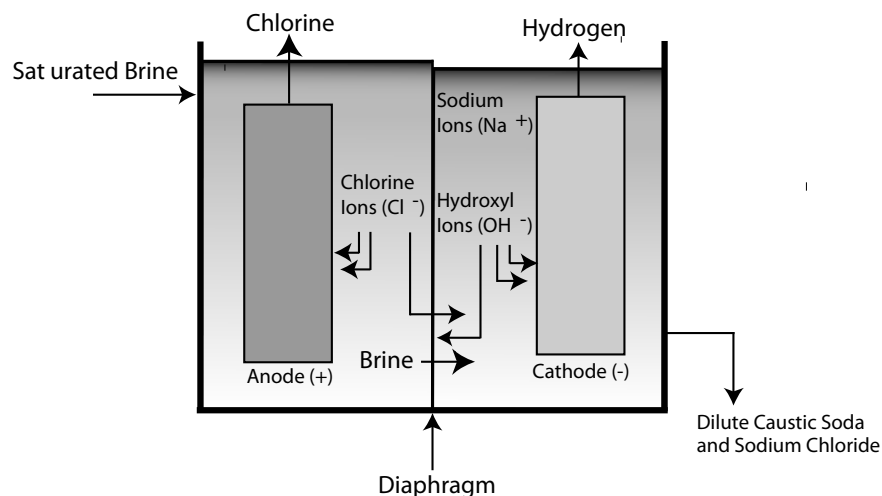
The sale of chlorine product requires accurate on-line measurement of chlorine purity to meet custody transfer specifications.

AMETEK Solution

The IPS-4 Diode Array is a cost-effective UV analyzer for the measurement of chlorine purity in custody transfer applications. The major advantage of the IPS-4 design is the rapid scan time of the diode array. Typically, a full spectrum is scanned in less than one second. This fast optical response allows for rapid corrective action when the chlorine product is off spec. The IPS-4 Diode Array provides fast on-line monitoring of chlorine purity with a reliable, easy-to-use analyzer.

Process Overview

The most common process for manufacturing chlorine is the electrolytic reaction of a brine



solution of sodium chloride and water to form chlorine, caustic soda and hydrogen. This reaction results in the production of the co-products chlorine and caustic soda also called alkali. The linking together of these co-products has resulted in the "Chlor-alkali" industry.



The on-line measurement of 90 – 100 % chlorine with the IPS-4 Diode Array Spectrophotometer ensures that the chlorine product meets custody transfer specifications. The use of pressure compensation is very important for applications with suppressed ranges such as 90 – 100%. The 90% chlorine and 100% chlorine samples both have high concentrations of chlorine molecules that

are susceptible to pressure effects. The IPS-4 analyzer utilizes inputs from a pressure transducer to provide a pressure compensation algorithm for fluctuations in pressure in the chlorine process stream. The IPS-4 can also utilize temperature compensation for the chlorine purity measurement.

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AMETEK IPS-4 Diode Array

The new AMETEK IPS-4 On-line Diode Array is a cost-effective UV/visible analyzer that is designed for single and multiple component applications. The IPS-4 analyzer can be used in a wide variety of gas phase or liquid phase chemical composition monitoring applications. The IPS-4 provides a number of features.

AMETEK IPS-4 Features

- Fast optical response time of diode array
- Modular integrated photometer system for UV, VIS and NIR applications
- No moving parts in the optical bench provide excellent wavelength stability
- Easy-to-use, multi-language vacuum fluorescent display
- Xenon flash lamp source provides long service life – typically greater than two years
- Auto zero and auto calibration capability
- Optional heated sample cell enclosure available for operation up to 150° C
- MODBUS RTU communications protocol
- Pressure and temperature compensation available
- Corrosion resistant NEMA-4X indoor/outdoor housing

Process Instruments' Expertise

The implementation of the IPS-4 Diode Array Spectrophotometer includes the full global sales, service and training support of the AMETEK Process Instruments division. AMETEK's application expertise in chemical processes and handling of toxic and corrosive samples ensure the successful installation of the IPS-4 Analyzer for on-line chlorine purity monitoring.

IPS-4 Potential Chlorine Applications

- Low ppm chlorine in phosgene in polycarbonate processes
- Low ppm chlorine in ambient air
- % chlorine in HCl
- % chlorine in propylene in a polymer plant

Other AMETEK analyzers

- 304MCA - PPM water in dry chlorine gas



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