

On-Line Monitoring of Bisphenol A in Polymer Plants

Bisphenol A (BPA) is a chemical building block that is used to make polycarbonate plastic and epoxy resins. Polycarbonate is a lightweight, high-performance plastic that is used for products such as electronics, automotive and sports safety equipment. Epoxy resins are used for paints and adhesives as well as a variety of protective coatings.

Measurement Requirement

Although most of the Bisphenol A is consumed in the polycarbonate and epoxy manufacturing processes, low level releases of residual Bisphenol A are possible. The level of Bisphenol A present in the process effluent must be measured to ensure that it meets environmental regulations. A typical range for BPA in the effluent is 0-25 ppmw although a 0-100 ppmw measurement range is often used to monitor possible process upset conditions.

AMETEK Solution

The IPS-4 diode array is a cost-effective UV spectro-photometer for the measurement of low ppmw Bisphenol A in effluent water. A major

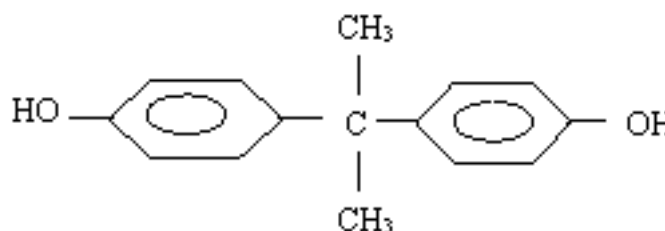
advantage of the IPS-4 is the rapid scan time of the diode array. Typically a full spectrum is scanned in less than one second. This fast optical response allows for rapid corrective action when an upset level of BPA occurs in the polymer plant effluent. The IPS-4 provides fast on-line monitoring of BPA in effluent with a reliable, easy-to-use analyzer.

Application Discussion

The chemical formula for Bisphenol A is:



The structure of Bisphenol A is shown below:



An important consideration when measuring Bisphenol A in effluent is the pH of the aqueous stream. BPA exists as an acid in acidic streams and as a phenate salt in alkaline streams. The UV absorption band for phenol at 265 nm shifts to 285 nm for the phenate absorption. In most Bisphenol A applications, the pH of the effluent is adjusted with caustic and the phenate is measured at 285 nm. There is less susceptibility to interfering components at the 285 nm wavelength for the phenate absorption band.

The on-line measurement of Bisphenol A in water with the IPS-4 Diode Array Spectrophotometer ensures that the effluent water meets environmental regulations.

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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 provides excellent wavelength stability
- Easy-to-use, multi-language LED 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
- 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 ensures the successful installation of the IPS-4 analyzer for the on-line monitoring of Bisphenol A in polymer plant effluent streams.

Potential IPS-4 Applications

- Low ppm chlorine in phosgene for polycarbonate processes
- Low ppm aromatics in water
- Phenol in water
- % chlorine in propylene in a polymer plant



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