



EDXRF Analysis for catalyst measurement in PIA and PTA plants

Introduction

The oxidation of p-xylene to produce Terephthalic Acid (TA) is enhanced by Co-Mn acetate and tetrabromo-ethane catalyst addition. The continuous on-line analysis of these catalysts; Co, Mn and Br, enables better control of the process thus enhancing yields, improving product quality and increasing throughput.

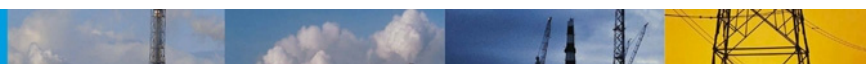
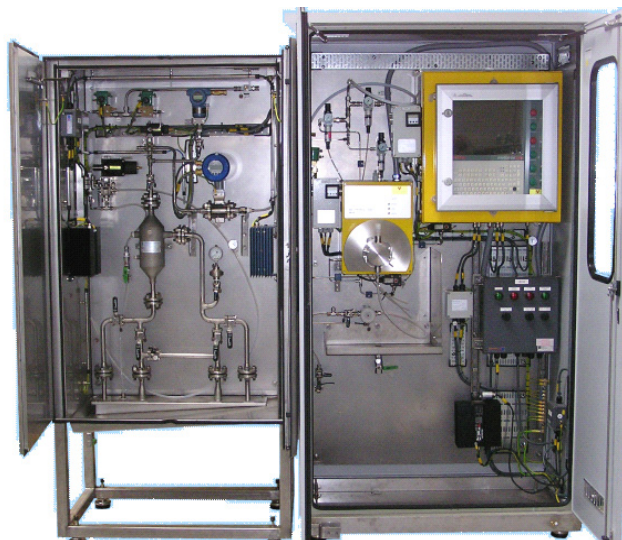
Sample handling system

Critical to the successful operation of the analyzer is the use of a properly designed and operated sample conditioning system. The system Hobré Instruments BV offers is based upon field experience with this aggressive and problematic process sample, and is specially designed for low maintenance operation.

- Low maintenance separator. Particle removal down to 2-3 microns without filter elements, reducing maintenance demand.
- Advanced safety system to protect analyzer against high pressure and prevent product leakage
- Simple calibration. Introduction of standard is one by hand, simply by use of syringe. No requirement for regular re-calibration.
- No sample recovery system; Low maintenance configuration allows installation of the analyzer on suitable location for atmospheric sample return, further minimizing maintenance demand
- Various other features and possibilities, please enquire.

C100 XT on-line XRF analyser

The simultaneous and continuous analyses of Co, Mn and Br catalysts are accomplished with a C100-XT On-line XRF analyser. The technology utilized is Energy Dispersive X-ray Fluorescence energized by an X-ray tube. No radioactive source is necessary. During the analysis the catalysts in the continuously flowing process samples are excited by the X-rays and emit their characteristic radiation. These emitted X-rays are detected and sorted with a patented Gas Proportional Counter (GPC) and converted into assays using stored calibration curves. For optimum process control, the sample measurement time is in the order of 5 minutes. The catalyst concentrations are generally in the range of 40 to 1000 ppm.





The C100 XT is a true process analyser, designed for the harsh environments found in chemical plants. The analyser is simple to configure and operate. It is equipped with analogue and serial data transfer protocols. The C100-XT can measure up to four streams sequentially, each with its own calibration curve. Furthermore, the C100-XT has a variety of methods to check and ensure reliable data. A built in solid reference is analysed every hour. With this built-in automatic referencing you will be able to realise a drift free process measurement over a period of one year.

Performance

Following characteristic performance we received from users of the Hobré Instruments BV Metorex C100-XT system:

	n	avg. (ppm)	1 sigma (ppm)	% deviation
Co	281	375	1.8	0.5
Mn	281	375	3.1	0.8
Br	281	819	2.5	0.3

The system is equipped with a flushing system, reducing the down time for unplanned maintenance caused by fouling of the system. Furthermore, manual calibration has been performed only once during 10 months.

Some other C-100XT benefits are:

- ATEX certified for zone 1 hazardous area installations
- Internal diagnostics
- Separate Electronics Unit and Measuring Head makes it more reliable
- Flow cell is specially designed for TPA applications
- Dual window construction; leak detector with contact output for automatic sample shut-off
- Internal Reference Sample for superior analytical stability
- Embedded PC for easy analyzer configuration with data display and status
- Embedded PC gives ability for higher count rates up to 60,000 per second which increases accuracy due to better signal/noise ratio
- Ethernet connection

