
PROCESS GAS CHROMATOGRAPHY

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Process gas chromatography (PGC) is a term used to describe the automatic, autonomous, and unattended application of GC to chemical processes. The instruments are typically used to provide real-time data that are used to control the production process, ensure raw material or final product quality, or ensure the safe and environmentally sound operation of the facility. The chromatographs are generally designed to be used for a single dedicated application, with one or more streams, for 15-20 years. The PGC analyzers are typically installed in an analyzer shelter rather than in a laboratory. The analyzer must meet the electrical classification of the zone where it is installed. A sample transport and conditioning system is designed and implemented to bring a fresh and representative sample to the analyzer. The analytical method is developed to meet the measurement needs (range, accuracy, composition) as well as total analysis time and overall system reliability requirements. Valves are used for sample injection and column switching. Typically, a single temperature zone is used and isothermal separation is applied. This may require the use of multiple columns and back/fore flushes, heart cuts, or other techniques to achieve the required separation in the desired time frame. In most cases, thermal conductivity or flame ionization detectors are the detectors of choice. The development, implementation, and support of these systems require a multi-functional team. Analyzer engineers, process control experts, maintenance technicians, reliability engineers, and process engineers must all collaborate with the chromatographer to ensure the success of the analysis.

This tutorial will cover the lifecycle of a PGC project, from selection through development, calibration, implementation, and support. Key factors that influence the long-term viability of the analysis for each stage will be described.

References

Process Gas Chromatography: Fundamentals and Applications.

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<http://www.analyzer.com/theory/documents/Gas%20Chromatography/General%20Theory.aspx>