C.I. Analytics

Common Applications for C.I. Analytics Analyzers

2085 Industrial Blvd., Chambly, Quebec, Canada J3L 4C5
Tel.: 001-450-658-4965 Fax: 001-450-658-3428
E-mail: sales@cianalytics.ca
www.cianalytics.com

Common Applications for C.I. Analytics Analyzers

Below you will find commonplace applications for C.I. Analytics instrumentation. At C.I. Analytics we work closely with our clients to help design and manufacture some of the world's most innovative analyzers and have cultivated a reputation for achieving the impossible.

In our latest breakthrough, we adapted our dry colorimetric methods to meet a customer's requirements, making ***C.I. Analytics the first analyzer manufacturing company in the world to measure NOx in ethylene at levels as low as 20ppb***.

Call us today to find out how we can provide the solution for your analytical needs!

Ammonia (NH_3) Monitoring in Ethylene Polymerization

Ethylene is an organic chemical refined from crude oil distillates. It is sold by refineries to chemical processors for polymerization to polyethylene, from which a variety of plastics are manufactured. Ammonia (NH_3) is usually present in the ethylene streams in concentrations up to 1 ppm (part per million), and can contaminate the catalysts used in the polymerization process. When this occurs, the catalyst must be regenerated or replaced; a very expensive procedure in terms of time, chemicals and production losses due to process downtime. To avoid catalyst contamination, a reliable, accurate measurement of ammonia content in ethylene is desirable and has become one of the ethylene purity checks used in assessing product quality. Chemical processing plants will not accept ethylene with an ammonia concentration of 1 ppm or higher; the ammonia must be diluted, scrubbed or otherwise removed by the refiner. C.I. Analytics provides analyzers capable of monitoring ammonia and works to ensure your compliance with product quality standards.

Arsine (AsH_3) Monitoring in Propylene Polymerization

Propylene is an organic chemical refined from crude oil distillates. It is sold by refineries to chemical processors for polymerization to polypropylene, from which a variety of plastics are manufactured. Arsine (AsH_3) is usually present in the propylene streams in concentrations up to 50 ppb (parts per billion), and can contaminate the catalysts used in the polymerization process. When this occurs, the catalyst must be regenerated or replaced; a very expensive procedure in terms of time, chemicals and production losses due to process downtime. To avoid catalyst contamination, a reliable, accurate measurement of arsine content in propylene is desirable and has become of the propylene purity checks used in assessing product quality. Chemical processing plants will not accept propylene with an arsine concentration of 50 ppb or higher; the arsine must be diluted, scrubbed or otherwise removed by the refiner. C.I. Analytics provides analyzers capable of monitoring arsine and helps to verify the quality of your product.

Chlorine (Cl_2) Monitoring in Phosgene Production

Chemical processors manufacturing phosgene ($COCl_2$) for use in the manufacture of resins, which are later used in dense plastics, have a need for monitoring chlorine (Cl_2). As chlorine is combined with carbon monoxide (CO) to form phosgene, a tendency exists for residual chlorine to be present with the phosgene. Quality control within the chemical company does not allow phosgene containing more than 1 ppm of chlorine. The goal is to produce the purest resin possible, which will bring the highest price and produce the strongest and highest quality plastics. All phosgene producers have a need for this analysis – the residual chlorine affect is inherent in the chemistry. With our phosgene analyzer your company can rest assured that you are commanding the highest price possible for your products.

Hydrogen Sulfide (H_2S) Monitoring of Liquified Petroleum Gas and Natural Gas

The U. S. Department of Transportation has regulated the amount of hydrogen sulfide (H_2S) allowable during the transport of liquified petroleum gas (LPG) and natural gas, due to the caustic nature of H_2S. Tanker loads must be checked for H_2S concentration before they can be allowed on the nation's highways, railways and waterways. H_2S reacts with stainless steal containment systems, such as those used in transporting LPG, which could lead to failure or rupture of the container and cause potentially fatal leaks or explosions if ignited. Hydrogen sulfide monitoring is necessary at certain pipeline transmission checkpoints for the same reasons. C.I. Analytics can give you peace of mind by verifying that your tanker load H_2S limits are well below the safety requirements.

Phosgene ($COCl_2$) Monitoring in MDI Manufacturing

Monochlorobenzene (MCB) is used with phosgene ($COCl_2$) in the manufacture of methylene diphenyl diisocyanate (MDI). High levels of phosgene become very sticky in this process, causing the reactor to "gum up" during MDI production. When this occurs, the reactor and portions of the plant must be overhauled, entailing a complete disassembly and cleaning (some components are destroyed and must be replaced). Of course, this is a very expensive and time-consuming procedure, involving many man-hours, lost chemicals and lost profit due to production down-time. In fact, this procedure can cost up to $300,000 which helps justify the price of the analyzer and ensures a fast payback period. Our phosgene analyzer can help your company to start saving money immediately.

Total Sulfur Monitoring in Ethylene and Propylene Refining

One principle activity at most large refineries is the refining of ethylene and propylene from crude oil and its derivatives. Sulfur and sulfur compounds are present to some extent in almost all crude oil reserves in the western hemisphere. Ethylene and propylene are primarily used as raw materials in the manufacturing of plastics; these process streams are sold to chemical processing plants where they are polymerized.

Sulfur compounds poison the polymerization process employed in converting ethylene and propylene to polyethylene and polypropylene, respectively. Very expensive catalyst chemicals are destroyed as a result of the "poisoning". Because of this, sulfur compounds are scrubbed from ethylene and propylene process streams, normally at the refinery prior to sale to the processor. Lead oxide (PbO) scrubber beds are used as sulfur scavengers. Similar to an automobile catalytic converter, the scrubber bed consists of a large reactor vessel filled with millions of ceramic balls, which are coated with lead oxide.

Lead oxide has a tremendous affinity for absorbing many different sulfur compounds but, eventually, reaches a saturation point, when reactivity drops and no more sulfur can be absorbed. When this point is reached, the scrubber bed must be regenerated. Usually, scrubber beds are operated in parallel, enabling one bed to be regenerated while the other remains on-line. Without a sensitive, specific, on-line sulfur analyzer, the beds are regenerated every four to seven days as a safeguard (whether it is needed or not). Bringing in a C.I. Analytics Total Sulfur analyzer can virtually eliminate the need to perform unnecessary regeneration of the scrubber bed.

Total Sulfur Monitoring in Liquified Petroleum Gas

Liquified petroleum gas (LPG) is one of the key products of any refinery. LPG is usually sold to a processing facility to be further refined. This refinement often requires the use of expensive catalysts.

Sulfur compounds, naturally found in petroleum products, act as poisons to noble metal catalysts used in the processes employed in converting feedstock to useable intermediate and end products. Because of this, sulfur compounds are removed entirely from the LPG at a point prior to a vulnerable process or prior to sale to a processor or end-user. Analyses are made at a point directly downstream from the sulfur removal step and are used as a check on sulfur scrubbing efficiency. The sulfur removal process can typically be hydrotreatment (over a non-sulfur-sensitive catalyst) or scrubbing with some (solid or liquid) material that reacts with and removes the sulfur compounds.

Scrubber removal materials have tremendous affinity for absorbing many different sulfur compounds, but eventually reach a saturation point, at which reactivity drops and no more sulfur can be absorbed. When this point is reached, the scrubber bed must be replaced or regenerated. Usually, scrubber beds are operated in parallel, enabling one bed to be regenerated while the other remains on-line. Without a sensitive, specific, sulfur analyzer, the beds are regenerated much more frequently than necessary, as a safeguard against sulfur breakthrough. The consequences of a down or ineffective scrubber include: product waste, production downtime, spent scrubber material and poisoned noble metal catalyst. Our Total Sulfur analyzer can prevent these losses.

Total Sulfur Monitoring in Naphtha

All refineries manufacture products from crude oil and its derivative. These products consist of a wide range of fuel oils and types of gasoline and also include naphtha, asphalt, coke additives, waxes, lubricating oils, solvents, etc. Sulfur and sulfur compounds are present to some extent in almost all crude oil reserves.

Sulfur compounds are poisons to the catalysts used in many processes employed in converting feedstock to useable intermediate and end products. Very expensive noble metal catalysts (platinum, palladium, rhodium, rhenium, iridium) are destroyed as a results of this “poisoning”. Because of this, sulfur compounds are removed from refinery streams of all kinds, normally at a point prior to a vulnerable process or prior to sale to a processor or end-user. Analyses are made at a point directly downstream form the sulfur remove step and are used as a check on removal efficiency. The sulfur removal process can typically be hydrotreatment (over a non-sulfur-sensitive catalyst) or scrubbing with some (solid or liquid) material that reacts with and removes the sulfur compounds.

Scrubber materials for naphtha have tremendous affinity for absorbing many different sulfur compounds, but eventually reach a saturation point, at which reactivity drops and no more sulfur can be absorbed. When this point is reached, the scrubber bed must be replaced or regenerated. Usually, scrubber beds are operated in parallel, enabling one bed to be regenerated while the other remains on-line. Without a sensitive, specific, sulfur analyzer, the beds are regenerated much more frequently than necessary, as a safeguard against sulfur breakthrough. Sulfur analysis is necessary also to monitor the performance of catalysts for removal of sulfur by hydrotreating. Our Total Sulfur analyzer can virtually eliminate the need to perform unnecessary regeneration of the scrubber bed and aid in monitoring catalyst performance.