



TopSafe™ online hydrogen analyzer

SAFEGUARD YOUR CATALYST PERFORMANCE

Safe and fast copper catalyst reduction.

TOPSOE

On-site reduction methods of copper catalysts can affect catalyst performance for years. With TopSafe™, you get maximum performance from your catalysts as well as the safest and most efficient reduction process available in the industry.

Monitoring of hydrogen levels is important during copper reductions, especially during periods of changing hydrogen feed rates. With the TopSafe™ online hydrogen analyzer, continuous measurements reduce the risk of runaway temperatures and subsequent harm to catalytic activity.



Safety

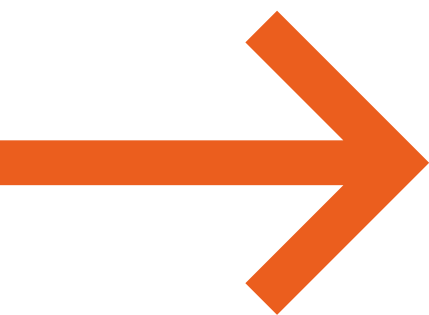
Due to the exothermic nature of the reduction reaction, measurement of hydrogen levels at the inlet and outlet of the reactor is an integral component of a safe reduction. The TopSafe™ online hydrogen analyzer, calibrated for accuracy before every reduction, provides continuous and reliable measurements of the hydrogen concentration with near-instantaneous response times. As a result, operating conditions can be adjusted quickly to avoid harmful consequences such as temperature runaways.

Maximum conversion from reduced catalysts

Temperature excursions during reduction can impact the size of the copper crystallites in the catalyst and lower the catalytic activity. Since the temperature is controlled by the rate of hydrogen addition, the TopSafe™ solution ensures that the conditions of the reduction are optimized for maximum performance from the reduced catalyst.

Optimized and fast reduction

Catalyst bed temperatures are continuously monitored along with the online hydrogen measurements. The quick response time of the analyzer combined with fast identification of possible hotspots makes it possible to perform the reduction closer to the optimal limits, reducing the time required to complete the process.



Advantages

- Safety
- Maximum conversion from reduced catalysts
- Optimized and fast reduction