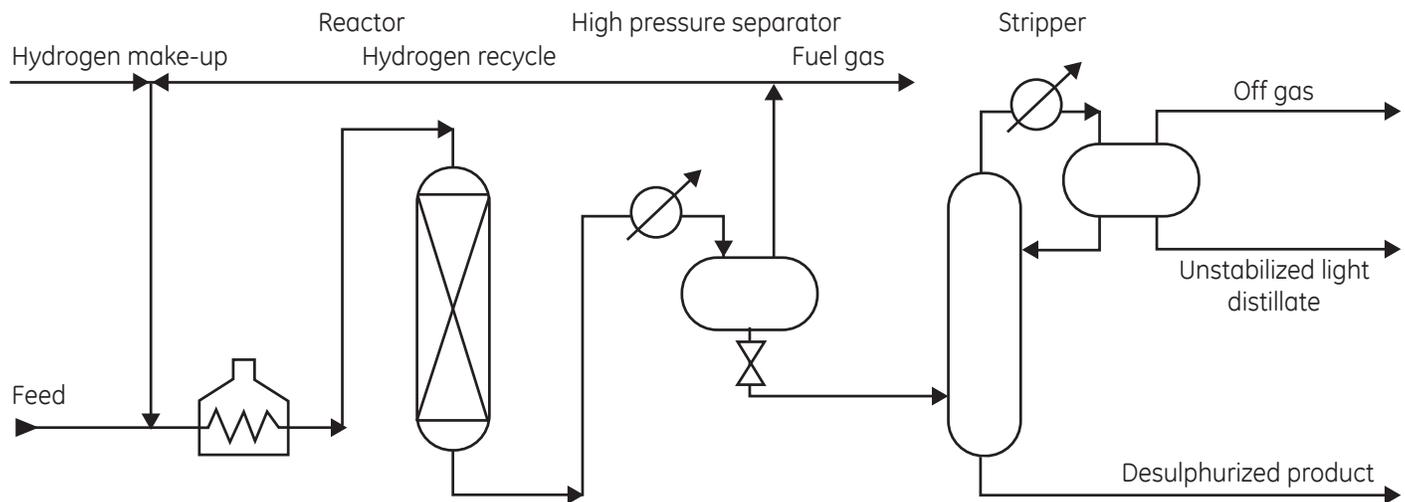


Hydrogen Recycle in Refining



Source: OSHA 1996.

What it is?

The objective of the refining process is to convert crude oil to useful and profitable end products, such as gasoline, jet fuel, diesel oil, liquefied petroleum gas and fuel oils. Hydrogen is widely used in refining processes.

- to increase the efficiency or throughput of the chemical reaction,
- to optimize the yield of the desired end product,
- to improve quality of end product,
- to remove undesired contaminants in fuels, such as sulfur, and
- to maximize catalyst life.

There are many sub-processes which utilize hydrogen, including hydrotreating, hydrocracking, catalytic reforming, fluid catalytic cracker, isomerization, and alkylation. These sub-processes vary depending on the input feed stock and the desired modification to that feedstock, such as sulfur removal, or need to produce specific end products, such as diesel oil. Hydrogen consumption by oil refineries is growing due to low sulfur in diesel requirements, increasing use of low quality heavy crude oil which requires more hydrogen to refine and increasing global oil consumption. Therefore, management of hydrogen and its associated cost is critical.

Why is moisture measurement important?

Moisture content varies depending on the process from sub-1 ppm levels to 20-30 ppm. Incorrect moisture concentrations can have negative effects on catalyst life, reaction yield, and end product quality. For example, in isomerization, the moisture content must be tightly controlled to less than 1 ppm to prevent poisoning of the catalyst. For CCR application, moisture is a necessary component of the chemical reaction and must be maintained at the 15-20 ppm moisture level.



Why Aurora Moisture Analyzers?

With Aurora moisture analyzers, you can rest easy knowing you have a continuous, reliable moisture measurement that will alert operations of moisture content excursions before the catalyst is destroyed or valuable product is lost. Aurora analyzers provide speed of light response with problem free performance immune to contaminants such as HCl. With an easy to use interface, Aurora improves operator productivity by providing the most relevant information necessary to make smart process decisions. The measurement is non-contact so there is no drift or need for calibration. Aurora analyzers require very little maintenance and come with complete sample system for easy installation and startup. Just connect and go.

Table of critical specifications

	Aurora Trace	Aurora
Accuracy	For H2 recycle applications with 10% H2 and 5% C2H6 variation from nominal: ± 100 ppb _v or 4% of reading	For H2 recycle applications up to 10% H2 and 1% C2H6 variation from nominal: $\pm 2\%$ of reading or 4 ppm _v
Repeatability	± 10 ppb _v	± 2 ppb _v below 200 ppm, 1% above 200 ppm
Hazardous Area Certification	US/Canada: Explosion-proof for Class I, Division 1, Groups B, C, D	US/Canada: Explosion-proof for Class I, Division 1, Groups B, C, D
	ATEX and IEC Ex: Ex de IIB+H2 T6 -20°C to +60°C Flameproof with increased safety compartment	ATEX and IEC Ex: Ex de IIB+H2 T6 -20°C to +65°C Flameproof with increased safety compartment



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