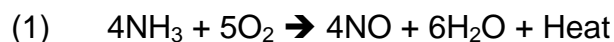


Gasmeter™ in process monitoring – applications:

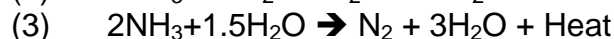
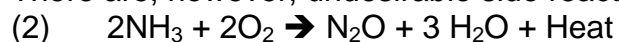
Nitric Acid Manufacturing: stack measurements

Process:

NO is an intermediate product in manufacturing of nitric acid. NO is a reaction product of NH₃ in catalytic (Pt/Rh) reaction:



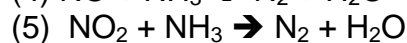
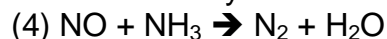
There are, however, undesirable side reactions:



At the final stage NO reacts with H₂O to form Nitric acid.

Emissions:

Some part of NO does not react with H₂O to form nitric acid, and remains present at the tail gas. NO and NO₂ in the tail gas are typically reduced to N₂ by Selective Catalytic Reduction unit (SCR):



Measurements:

There are three main purposes for tail gas (emissions) measurement:

1. Emissions monitoring
2. Controlling ammonia feed to SCR
3. N₂O measurement indicates the amount of undesirable side reaction (2)

In addition to emissions monitoring and controlling of DeNO_x system, measurement with **Gasmeter™** FTIR gas analyzer gives valuable data for controlling the ammonia oxidation reaction itself. Ammonia as raw material is 90% of total cost of nitric acid manufacturing, and therefore optimal process conditions are vital.



Typical application

H ₂ O	0-5	Vol-%
NO	0-50	ppm
NO ₂	0-50	ppm
N ₂ O	0-2000	ppm
NH ₃	0-25	ppm

Gasmeter™ CEMS –system:

CX4000 FTIR gas analyzer; Gasmeter sampling unit; Gasmeter Industrial Computer; Analog outputs or ModBus;
Heated sample probe; Heated sample lines

Application example

El Dorado Nitrogen (Baytown, Texas, USA) has been using **Gasmeter™** analyzer since early 2003 for stack emissions monitoring. The **Gasmeter™** system is measuring NO, NO₂, NH₃ for continuous emissions monitoring purpose. The response of **Gasmeter™** system is fast enough to allow control of ammonia feed for SCR. El Dorado Nitrogen is also using N₂O levels of stack gas to monitoring the efficiency and fine tuning of original ammonia oxidation efficiency in the ammonia converter.