

# Gasmeter™ FTIR application note

## Carbon Sulfide Emissions in Nickel Mining Operations

### KEY WORDS

- Nickel mining
- Flotation process
- Sodium Ethyl Xanthate
- Carbon Disulfate

### PRODUCTS

- [DX4040](#) Portable FTIR Gas Analyzer

### OVERVIEW

The mining industry uses chemicals as 'flotation' agents in the recovery of sulphide minerals containing metallic elements (e.g., copper, nickel, silver, gold) from ore slurries. Sodium Ethyl Xanthate (SEX) is one of most common flotation agents, and it decomposes to Ethanol and Carbon Disulfide / Carbonyl Sulfide, which must be monitored in indoor air in the enriching plant.

Xanthate solution is stored in tanks, which need periodic cleaning due to sludge buildup as the chemical decomposes over time. Removing the sludge releases sulfur containing gases ( $CS_2$ , COS) and the cleaning interval varies from 3 to 12 months.

In the actual flotation process, workers involved in checking flows, the head tank or in adjusting and monitoring the pulp levels in the flotation process could be exposed to  $CS_2$ .

A portable FTIR multi-gas analyser provides accurate and reliable readings for  $CS_2$  and COS with simple calibration (zero calibration only) and straightforward operation. The standard configuration contains up to 25 gases, making the instrument a versatile tool for occupational health measurements involving various mining chemicals.

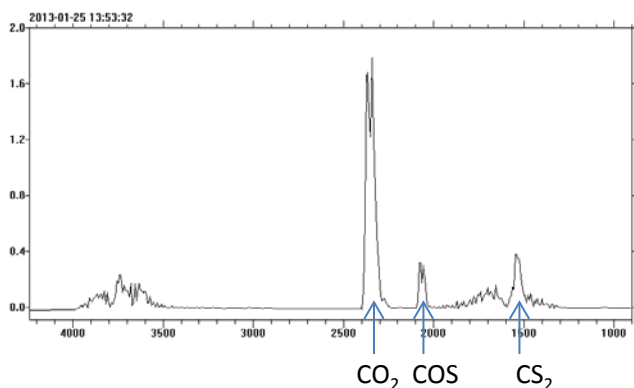


**Left and above** Short term and periodical measurements can be carried out with the battery powered portable analyzer and wireless handheld computer in field conditions.

## TYPICAL COMPONENTS FOR NICKEL REFINING APPLICATIONS

Compound name	Formula	Range	Unit
Water	H <sub>2</sub> O	0 - 5	vol-%
Carbon Dioxide	CO <sub>2</sub>	0 - 20 000	ppm
Carbon Monoxide	CO	0 - 1000	ppm
Sulfur Dioxide	SO <sub>2</sub>	0 - 400	ppm
Carbonyl Sulfide	COS	0 - 50	ppm
Carbon Disulfide	CS <sub>2</sub>	0 - 50	ppm
Nickel Carbonyl	Ni(CO) <sub>4</sub>	0 - 5	ppm

Other ranges and compounds available; please contact Gasmeter Technologies for further details.



**Above:** Typical FTIR sample spectrum showing Carbonyl Sulfide and Carbon Disulfide in air. Different gases are identified based on their peak position and shape, and the peak height is used to determine concentration.

**Right:** Slurry containing Nickel ore and flotation agents. The spectrum above is measured at this point.



This application note is meant to be an informative example of typical application where Gasmeter analyzers could be used. This is not a technical specification sheet. Information in this document is subject to change without prior notice. Optimal product configuration is application dependent, and exact application details such as detection limits, components included in the application, etc depend on process and/or measurement site details and may vary. Please, contact your local Gasmeter sales representative to get information specific to your needs.

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