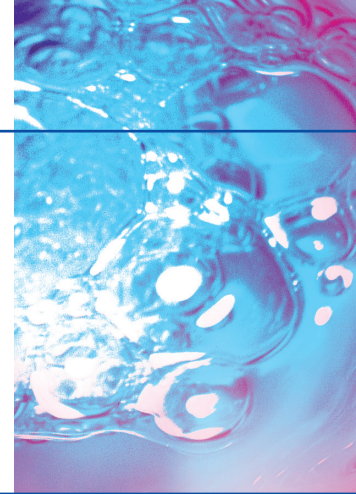


Measurement of dissolved H₂S, (hydrogen sulphide), in difficult applications such as tanneries, circuit board waste and waste water treatment



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**WATER/
Wastewater**

ATi has developed a new dissolved hydrogen sulphide monitor that for the first time enables you to measure levels of H₂S in difficult applications.



Measurement and control of H₂S levels after pre-treatment is vital because the presence of even low levels of H₂S will have a detrimental impact on subsequent biological treatment processes. Measurement at the discharge point is important to ensure compliance with legal requirements.

PCB manufacture
Hydrogen Sulphide gas is used to treat exhaust etching solutions from PCB industries, containing high level of Copper under Ammoniacal complex form. The gas is used to precipitate Copper Sulphide. The sulphide level must be always in a small excess (few ppm, usually 5 - 10) in order to be sure that all Copper is precipitated. Measurement of dissolved sulphide would allow control of the process.

The waste water from this process also needs to be processed to remove dissolved sulphides.

Municipal Waste Water Treatment

Sulphide can also build up in wastewater collection systems due to the anaerobic conditions that frequently occur. When sulphides occur they can cause damage to concrete structures, they can lead to septic conditions and create "black primary tanks" and are also the primary cause of odour problems.

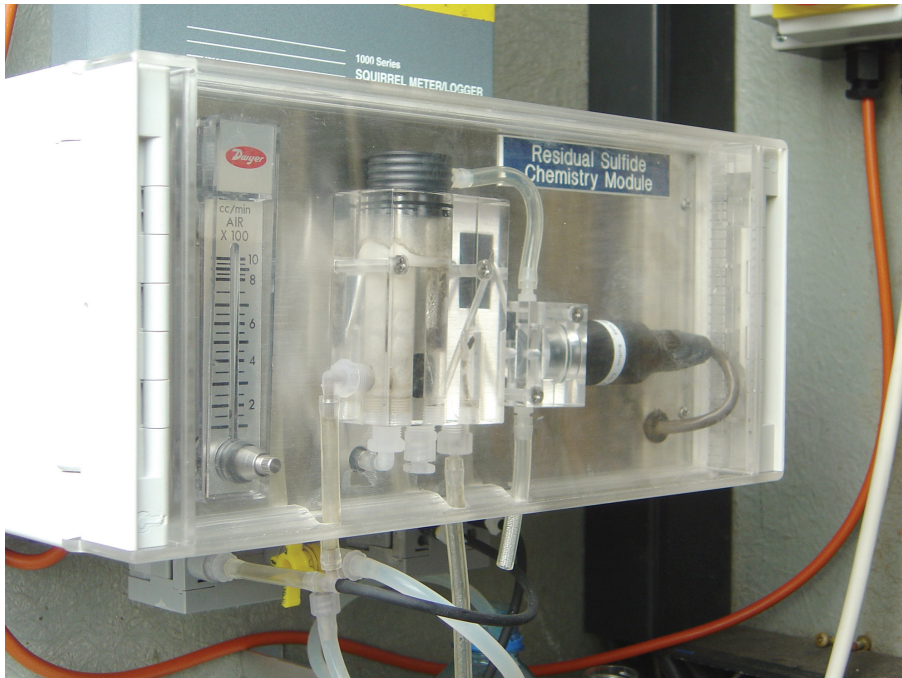
To remove sulphides it is necessary to add oxidants. Another approach is to prevent sulphide formation. Many companies measure gas phase H₂S in wet wells to give an indication of whether there is dissolved sulphide problem. This indirect method of sulphide determination is not sufficient to allow control of the dosing systems used to remove dissolved sulphides because .

- 1) There are many factors that affect the relationship between dissolved sulphide and gas phase sulphide
- 2) The gas detector is in a corrosive environment. The H₂S will attack the enclosure seals and sensor often only last 12 months.

Measurement of sulphides in water has also sometimes been carried out using selective ion electrodes, while this method is sensitive, such system require frequent zeroing and calibration adjustment. Some systems have used ORP to indicate dissolved sulphides. A semi direct method is to measure ORP/Redox in the water and use this to predict H₂S levels. This method is fraught with difficulties.

- 1) A Redox measurement is non specific, the values are affected by many other components of the sample
- 2) The relationship between Redox and H₂S concentration is not linear





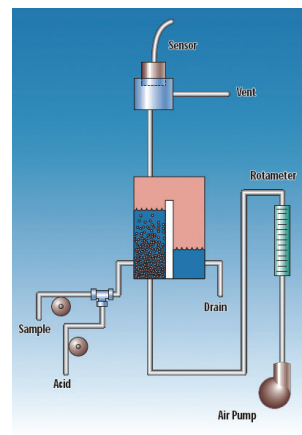
- 3) At low H_2S levels Redox is not sensitive enough
- 4) Redox probes have to be immersed in the sample and foul easily

The measured or calculated concentration of dissolved sulphide is then used to determine the dosing rate of oxidants or inhibitors such as hydrogen peroxide and ferric nitrate that are used to eliminate sulphide before they can cause problems. Until now the dosing control has been based on indirect measurements.

New approach

Measuring H_2S in these applications has been made easier ATi's new improved method for monitoring sulphide in solution. The measurement is done using a polarographic H_2S sensor that is never in contact with the sample.

In operation a small amount of pre filters sample is pumped into the analyser and mixed with



acid. In acid solutions chemical reactions lead to the production of H_2S . The sample then flows to an air-stripping chamber. Measurement of gas phase H_2S is carried out and the monitor displays an equivalent sulphide concentration in mg/l

This approach eliminates the big problem associated with H_2S measurement. Because the sensor never comes into contact with the sample fouling does not occur.

The A15/81 consists of two parts. A chemistry module where the sample is conditioned and an electronic display unit that shows the sulphide concentration. The electronics have 4-20mA outputs and alarm relays as standard.

The gas stripping technique of monitoring sulphide in solution provides an extremely sensitive on line monitor, measurement down to low parts per billion can be achieved. The design also means that monthly zeroing and calibration intervals are more than adequate.

The key benefits of the ATi dissolved sulphide monitor are:

- Continuous, accurate measurement of true dissolved sulphide levels
- Low maintenance due to non-contact gas phase measurement
- High accuracy and sensitivity measurement for fine control

This new approach allows true control of the dosing systems and real monitoring of sulphide levels in municipal waste water collection systems and industrial waste water processing.

