Solutions for Testing of

Crude Oil

made by ECH

ECH Elektrochemie Halle supports customers involved with crude oil testing within the oil & gas industry.

ECH provides solutions to accurately test crude oil parameters according to strict testing regulations from standards such as ASTM, ISO and IP.

Analytical instrumentation from ECH is configured to be used both onsite and in-lab allowing for accurate and representative test data to be obtained.

Water Content

According to standard ASTM D 4928 by **Aquamax KF Plus**

Hydrogen Sulphide Content

Determination according to standard ASTM D 7621 and IP 570 by **Sulfimax GX Go** or **Lab** with **H_2S Headspace Module**

Hydrogen Sulphide & Mercaptan Content

According to standard UOP 163 by **Titramax VT SULPHUR**

Water Content of Crude Oil

According to ASTM D 4928

aquamax KF Plus

Description

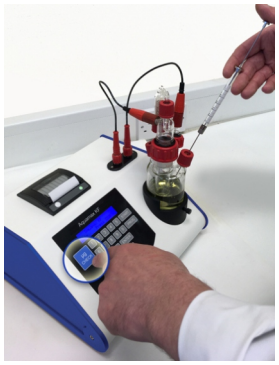
Analysis of the water content in crude oil is significant because excess water can cause corrosion of equipment and problems in processing. Water content determination is also required to measure accurately net volumes of actual oil in sales, taxation, exchanges, and custody transfers.

The standard method for measuring water in crude oils is ASTM D 4928, this test method covers the determination of water in the range from 0.02 to 5.00 mass or volume % in crude oils by coulometric Karl Fischer titration. Mercaptan (RSH) and sulphide (S2- or H2S) as sulphur are known to interfere with this test method, but at levels of less than 500 ·g/g, the interference from these compounds is insignificant.

The Aquamax KF Plus from ECH is an entry level direct injection coulometric titrator which can be used onsite at the refinery, platform or well-head. Alternatively, the Aquamax KF Plus can be used as a standalone benchtop coulometer in a laboratory setting.

There can be some issues during the coulometric titration of crude oils and further developments have been created to avoid these. Crude oils with levels of hydrogen sulphide or mercaptan sulphur can cause what is known as a side reaction when entered to the titration cell. They interfere with the coulometric Karl Fischer reaction.

Aquamax KF Plus - easy handling with high accuracy



Water check button and syringe

Water check

The µg check button allows the operator to simply press go, inject 1 µL or maybe 10 µL of distilled water (as required by some ASTM methods) and verify if the instrument and reagent are working with in their required specification. The µg check overrides the programmed calculation and displays/prints out a report of the verification check. The coulometer then automatically reverts to the pre-programmed setting.

Features

- Simple operation
- 10 user programmable methods
- 1 ppm/100 %
- Results in ppm, mg/kg, % water, µg water
- Multi language display & printout
- Small footprint
- Integral high speed printer
- Integral battery
- Fully portable
- Low drift cell design
- Results Manager software
- Automatically compensated errors (patented technique)

Hydrogen Sulphide Content

Conform to standard IP 570 and ASTM D 7621 (procedures B)

sulfimax GX

H_2S Headspace Module

Description

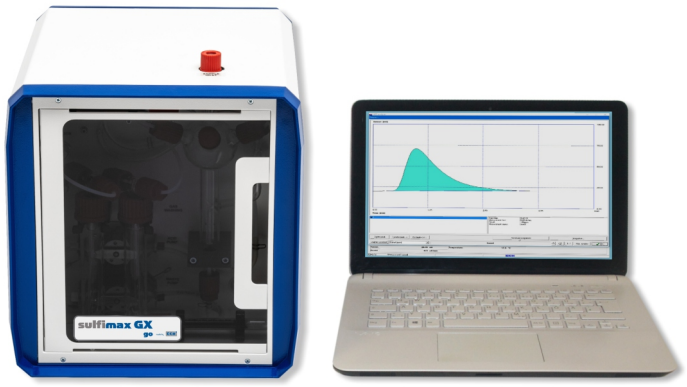
The measurement of hydrogen sulphide (H_2S) is used for quality control due to the corrosive nature of H_2S, and for safety purposes due to the toxicity of H_2S.

Hydrogen Sulphide gases are produced in the crude oil but are not strictly corrosive by itself, however if contacted with moisture occurs then the pipeline is at risk of sour corrosion which is demanding to drill pipes and can cause pipeline embrittlement.

ECH have developed a total H_2S analyzer for the determination of H_2S in all petroleum products such as crude oil, gasoline, diesel fuels and marine fuels according to methods such as IP 570 and ASTM D 7621 (procedures B), through to solid products such as sludges, bitumens, tar & elemental sulphur.

For petroleum and solid products, H_2S gas is heated out using an additional headspace module. Each sample is weighed in a vial, the vial is sealed and placed in the headspace oven which is heated up to 180 degrees C depending on sample composition.

The H_2S gas is extracted from the sample and using a pump/tubing system is transported into the **Sulfimax GX** system where the detection of H_2S occurs down to 0.1 ppm.

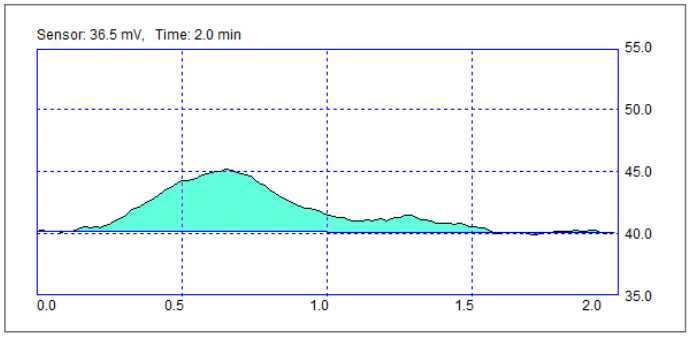


Sulfimax GX Go - H_2S analyzer as compact version

Sulfimax GX Lab - H_2S analyzer as laboratory version with connected H_2S Headspace Module

Advantages

- Easy connection to the H_2S analyzers for gases and liquids Sulfimax GX Lab and Sulfimax GX Go
- No sample preparation necessary for solid samples
- Very low H_2S concentrations detectable
- Measuring time from 2 to approx. 15 min, depending on the H_2S content of the sample
- Manually operated and robust measuring system
- Easy handling for everyone
- No solvent cleaning of extraction vessel necessary (disposable vials)
- Variable temperature adjustment from 30 to 180 °C



Determination of volatile H_2S from bitumen by headspace technique

Hydrogen Sulphide & Mercaptan Content

Conform to standard UOP 163

titramax VT SULPHUR

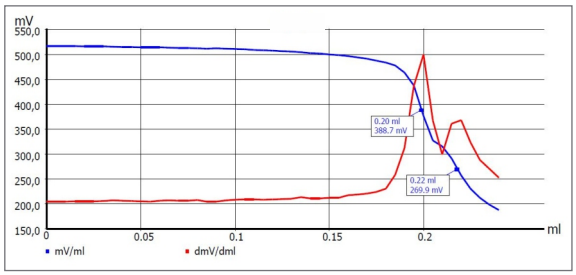
Description

A more traditional method for the determination of hydrogen sulphide comes in the form of titration, specifically, potentiometric titration according to UOP 163. This method details the determination of hydrogen sulphide and mercaptan sulphur in hydrocarbons by potentiometric titration.

Typical samples include gasoline, naphtha, light cycle oils and similar distillates. The lower limited of quantification is 0.2 ppm mercaptan, and 1 ppm hydrogen sulphide.

ECH offers the **Titramax VT SULPHUR** which is equipped with the with 10 mL exchangeable unit and metal combination electrode which allows for fully conformity to UOP 163 and subsequently, accurate determination of hydrogen sulphide and mercaptan sulphur content.

Titramax VT SULPHUR



Titration graph of a sample

Advantages of the Titramax VT SULPHUR

- Complete measuring system for the determination of hydrogen sulphide and mercaptan sulphur
- Fully-automatic volumetric titration
- Precise adjustment of the titration parameters by control algorithms
- Preset measurement method allows an immediate start
- The result output can be adjusted to your needs by using a formula generator
- Gas tight titration vessel with purging fittings

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