

The Significance of the Determination of Salt Content in Crude Oil

Yunfan Lu, Stanley Zhang, Dr. Raj Shah

Introduction

Crude oil often contains different inorganic salts and the large concentration of salt in crude can contribute to the mechanical clogging of furnace tubes, condensers, and lines via the formation of deposits. It is important to analyze the salt concentration in crude, so that the crude can undergo an appropriate desalting process before further progressing in the refinery process. The Koehler K23065 Salt in Crude Analyzer is an efficient and powerful tool to accurately and easily determine the salt concentration in crude.

How Our Device Works

Calibration

To ensure get a correct test result, complete calibrations for temperature, salt standards, and conductance every time before starting

Probe Setup

- Place the electrodes and temperature probe into the sample solution

Testing

Fill out parameters and press acquire to begin the test

Results

Results for salt concentration, conductance, and temperature will show on the screen



Koehler
INSTRUMENT COMPANY, INC.



Set up for Test

To use K23065 test salt concentration in crude oil, preparing a sample solution stated in ASTM D3230 procedure is necessary. As a start, add 15 mL of xylene and 10 mL of crude oil to a 100 mL graduated, glass-stopper cylinder. Make up to 50 mL with xylene and shake the cylinder for 60 s. Dilute the mixture to 100 mL with mixed alcohol solvent and shake for 30 s. Let the solution rest for 5 minutes before transferring to a dry test beaker for testing.



Test Method

The test method this instrument performs is ASTM D3230 – Standard Test Method for Salts in Crude Oil. It is also called Electrometric Method. By using this method, salt content is determined by measuring the conductivity of the sample solution stated in its procedure when subjected to an alternating electrical current and is obtained by comparison of the resulting conductivity to a calibration curve of known salt mixtures.



ASTM INTERNATIONAL

ASTM test methods are petroleum industry standards, accepted worldwide for quality and reliability.

Data Overview

The K23065 Salt in Crude Analyzer produces accurate readings for salt concentration given sample crude oil in a mixed alcohol solvent at different fixed salt concentration.

Sample Concentration (PTB)	Koehler K23065 (PTB)
0	0
1	1.18
3	3.01
5	5.05
10	10.76
16	16.23
21	21.24
26	26.54
31	31.64

Conclusion

The large concentration of inorganic salt in crude oil can cause various problems during the petroleum refining process, so measuring salt content, prior to and after the desalting process is necessary to satisfy industry standards. The Koehler K23065 Salt in Crude Analyzer is a powerful device that can determine the salt concentration in accordance with the ASTM D3230 test method quickly and accurately. It can help users avoid complications and costly equipment repairs during the refinery process due to excess salt content in crude.

References

ASTM D3230-10 "Standard Test Method for Salts in Crude Oil (Electrometric Method)," ASTM International
Salts in Crude Analyzer & Isolated Conductivity, pH and Temperature Measurement
Koehler Instrument Company, Inc. "Operation and Instruction Manual for K23065"