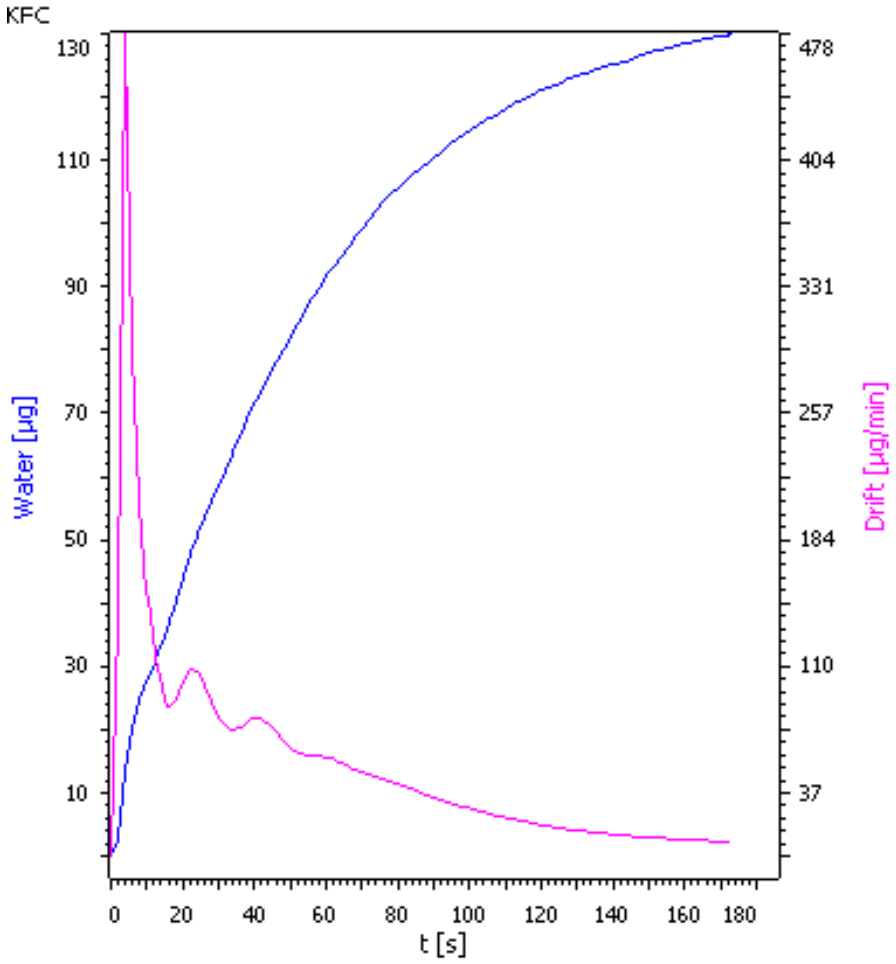
KF Application Note K–47

Determination of the water content in transformer oil with 885 Compact Oven Sample Changer and 899 Coulometer



This Application Note describes the determination of the water content in transformer oil using the oven technique.

Metrohm

Method description

Sample

Transformer oil (fresh)

Sample preparation

Approximately 4 g of sample were weighed into the sample vial, tightly closed with the cap, and placed on the rack of the 885 Compact Oven Sample Changer.

Electrodes

Double Pt-wire electrode	6.0341.100
Generator electrode with diaphragm	6.0344.100

Solutions

HYDRANAL®-Coulomat AG Oven	Fluka 34739
HYDRANAL®-Coulomat CG	Fluka 34840

Instrumentation

885 Compact Oven Sample Changer	2.885.0010
899 Coulometer	2.899.0010
Needle holder 58 mm	6.2049.040
Remote cable	6.2141.390

Analysis

All measurements were carried out at the same temperature using the same parameters.

In a first step, the titration vessel was conditioned. Then a determination with an empty sample vial was carried out to prepare the system and rinse all tubing. Following the system preparation, three blank values (empty sample vials) were determined and the mean value of the blank was saved as common variable. Since half of the sample vial was filled with sample, half of the blank value was subtracted from the EP of the sample determination (for more information on blank values, see AN-K-48). Subsequently, the water content of the samples was determined. Between two sample measurements, the titration vessel was conditioned again.

Parameters 899 Coulometer

Conditioning	on
Start drift	10 µg/min
Drift correction	auto
Automatic start	off
Stabilizing time	10 s
Cond. stop time	off
Measured value display	off
Pause	0 s
Request sample ID	off
Request sample size	off
Request sample unit	off
Hold at request	off
Endpoint at	50 mV
Titration rate	optimal
Stop criterion	rel. drift
Relative stop drift	10 µg/min
Extraction time	120 s
Generator electrode	with diaphragm
Generator current	auto mA
Stirrer	on
Stirring rate	15
I(pol)	10 µA
Electrode test	off
Time interval MP	2 s
Temperature	25 °C
Stop time	off

Parameters 885 Compact Oven Sample Changer

Temperature	105 °C
Flow rate	100 mL/min
Gas supply	valve
Gas type	nitrogen
End of series	conditioning

Results

Mean (n = 10) [µg/g]	RSD [%]
20.5	1.56