

TBN Base number according ASTM D4739

Determination base number in mineral oil according ASTM D4739

Sample	Motoroil, ca. 2.5 g.	Preparation and Procedures Sample size depends on the expected BN: Sample size (g) = 7 / expected BN Before the analysis determine the buffer potential, using MERCK buffer pH 3 Well homogenized sample is very important.
Substance	Acid capacity in oil as mg KOH/g oil M = 56.11 g/mol, z = 1	
Chemicals	60 mL solvent 4739 toulouene/2-propanol/chloroform/water= 10:10:10:0.3	
Titrant	Hydrochloric acid, HCl in 2-propanol c(HCl) = 0.1 mol/L	
Standard	Standardized KOH in 2-propanol	
Instruments	DL28 OKI B4250 Printer (parallel cable ME-51 108 780)	
Accessories	Titration beaker ME-101974	
Indication	DG113-SC	Remarks
Chemistry		
Calculation	R1: BN (mg/g) EQP R2: SBN (mg/g) bufferpotential 1 R3: BN (mg/g) bufferpotential 2	
Author	A. Aichert	

Results

Method ID 982 Title TBN ASTM 4739
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All results

Sample	Sample ID	Result	Calculated	Value	Unit
1	Oil	1	Cont.w.B	9.692	[mg/g]
		2	Cont.w.B	-0.015	[mg/g]
		3	Cont.w.B	8.922	[mg/g]
2	Oil	1	Cont.w.B	9.858	[mg/g]
		2	Cont.w.B	-0.016	[mg/g]
		3	Cont.w.B	8.955	[mg/g]
3	Oil	1	Cont.w.B	9.792	[mg/g]
		2	Cont.w.B	-0.015	[mg/g]
		3	Cont.w.B	8.689	[mg/g]
4	Oil	1	Cont.w.B	10.309	[mg/g]
		2	Cont.w.B	-0.015	[mg/g]
		3	Cont.w.B	9.015	[mg/g]

Statistics report

Result	n	x	s	Unit	srel [%]
1	4	9.912	0.273	[mg/g]	2.753
2	4	-0.015	0.000	[mg/g]	2.876
3	4	8.895	0.143	[mg/g]	1.608

Results

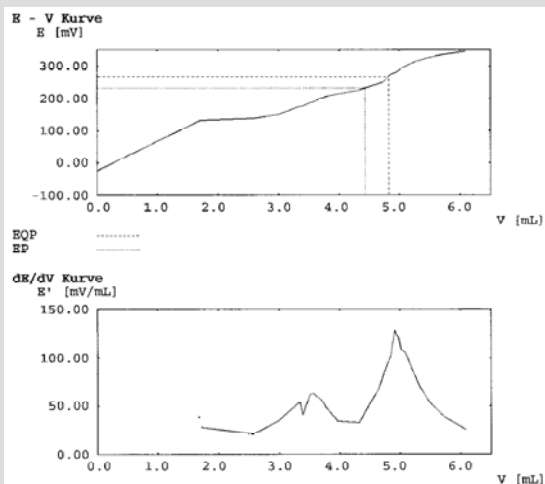
Active sample	Deleted samples
1	
2	
3	
4	

Table of measured values

Messwerttabelle

Volumen [mL]	Inkrement [mL]	Signal [mV]	Änderung [mV]	1.Ableit. [mV/mL]	Zeit [min:s]
0.000		-24.0			00:15
1.714	1.714	133.4	157.4	28.4	00:34
2.572	0.858	140.8	7.4	21.5	01:08
3.000	0.428	152.5	11.6	35.2	01:36
3.338	0.338	175.7	23.2	54.1	01:51
3.396	0.058	178.2	2.5	40.8	02:06
3.512	0.116	188.0	9.8	62.4	02:21
3.572	0.060	191.7	3.8	63.3	02:36
3.692	0.120	201.8	10.0	56.4	02:51
3.782	0.090	207.8	6.1	47.7	03:06
3.962	0.180	214.2	6.4	34.6	03:47
4.322	0.360	226.1	11.8	33.0	04:47
4.650	0.328	246.7	20.7	68.2	05:47
4.732	0.082	252.8	6.1	83.6	06:24
4.848	0.116	274.1	21.3	103.6	06:39
4.870	0.022	274.0	-0.1	110.9	06:54
4.914	0.044	278.8	4.8	129.0	07:09
4.934	0.020	280.2	1.3	125.4	07:24
4.974	0.040	285.1	4.9	121.7	07:39
5.018	0.044	290.9	5.8	109.1	07:54
5.090	0.072	300.0	9.1	105.7	08:09
5.172	0.082	308.2	8.2	92.6	08:24
5.298	0.126	317.5	9.4	72.7	08:39
5.480	0.182	327.6	10.0	54.1	08:54
5.724	0.244	337.1	9.6	38.8	09:09
6.084	0.360	346.7	9.6	26.6	09:24

Titration curve



Method

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Sample para.

Sample ID Oil
Entry type Mass
Minimum [g] 0.1
Maximum [g] 10.0
Density [g/mL] 1.0
Mol.m. [g/mol] 56.11
Equival. number z 1
Temp.sensor Manual
Temp. [°C] 25.0

Stir

Speed [%] 35
Mixing time [s] 30

EQP titration

Titrant HCl 0.1 prop
Conc.[mol/L] 0.1
Sensor DG113
Unit mV
Blank From list
Solvent TAN D4739
Predis.[mL] 3.000
Back value [mmol] 0.00

Control parameters

Set of parameters Normal
Addition Dynamic
dE(set) [mV] 10.0
dVmin [mL] 0.01
dVmax [mL] 0.4
Measure mode EQU controlled
dE[mV] 1
dt[s] 3
t(min) [s] 15
t(max) [s] 60

Recognition

Tendency Positive
Min Relevance 20.0
Threshold [mV/mL] 90.0
St. jump only No

Termination param.

Numb. EQPs 1
Vmax [mL] 20.0
At potential [mV] 250.0

Evaluation

Numb. Potentials 2
Potential 1 [mV] -208.00
Potential 2 [mV] 233.0

Calculation 1

Calculation Cont.
Type Cont. w. blank
Unit mg/g
Which EQP 1
Decimal places 3
Result limits No
Statistics Yes

Calculation 2

Calculation Cont.
Type Cont. w. blank
Unit mg/g
Which EQP Pot. 1
Decimal places 3
Result limits No
Statistics Yes

Calculation 3

Calculation Cont.
Type Cont. w. blank
Unit mg/g
Which EQP Pot. 2
Decimal places 3
Result limits No
Statistics Yes

Report

Output Printer
Results GLP
Meas. val. table Yes
E - V curve Yes
dE/dV curve Yes

Other Control parameters

Set of parameters **Fast**
Addition Dynamic
dE(set) [mV] 15
dVmin [mL] 0.01
dVmax [mL] 0.5
Measure mode EQU controlled
dE[mV] 1.0
dt[s] 1
t(min) [s] 5
t(max) [s] 60

Set of parameters **Cautious**
Addition Dynamic
dE(set) [mV] 8
dVmin [mL] 0.01
dVmax [mL] 0.2
Measure mode EQU controlled
dE[mV] 0.5
dt[s] 6
t(min) [s] 30
t(max) [s] 60