Saponification Number in fats and oils according to DIN 53 401

Application

Use

Determination of saponification number in fats and oils, fatty acids, resins and other organic technical solvents. The saponification number is expressed as the quantity of mg KOH that is required to saponificate 1 g of sample.

Appliances

- Titrator: TL 7000 or TL 7750 M1
- Basic device
- Magnetic stirrer TM 235
- 50 mL Exchange unit WA 50, with amber glass bottle for the titrant, complete
- Heatable magnetic stirrer, Erlenmeyer flask 200-250 ml and water cooler

Electrodes

- Electrode: N 6480 eth
- Electrolyte: L 5034 (LiCl/ethanol)
- Calibration: n.a.

Application

Reagents

- Titrant: HCl 0.1 - 0.5 mol/l in water or methanol
- Reaction agent : KOH 0,1 – 0.5 mol/L in ethanol
- Titer determination: Potassium hydrogen phthalate
- Solvent: i.e. toluene

Description

Determination of the exact concentration of the HCL titrant

We recommend ready to use HCl titrants. The exact concentration of the HCl 0.1 mol/l or 0.5 mol/l can be determined using the titrimetric standard TRIS (hydroxymethyl) amino methan.

In a 150 mL beaker, 0.15 g/ 0.75 g of the standard are weighed accurately and dissolved in 80 mL of dist. water with stirring. It is titrated with the 0.1 / 0.5 mol/l HCl solution.

Repeat the standardization two times. The average value is stored automatically in the exchangeable unit.

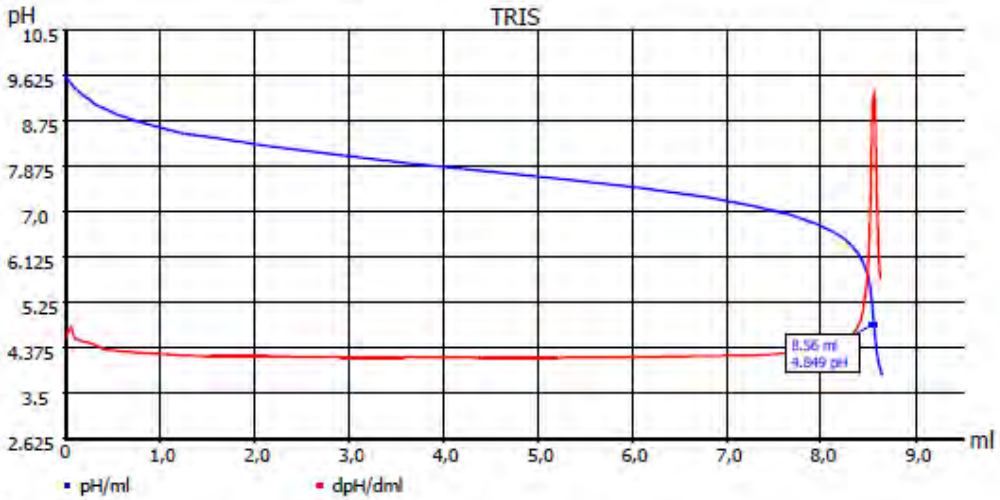
Pic. left: titer

Application

Page 1: Curve and result: Titer determination

GLP documentation

Titration graph



Method data

Method name:	Titre HCl	Titration duration:	3 m 8 s
End date:	13.09.12	End time:	14:39:30

Titration data

Sample ID:	TRIS	Weight:	0.1038 g
Start pH:	pH 9.590	End pH:	pH 3.864
Start temperature:	25.0 °C (m)	End temperature:	25.0 °C (m)
Zero point:	pH 6.83 / -10.0 mV	Slope:	100.6 % / -59.5 mV/pH
EQ:	8.560 ml / pH 4.849	Titre:	0.1001 mol/l

Calculation formula

Titre:	(W*F2)/((EQ1-B)*M*F1) -> M103
Mol (M):	121.14000

Page 2: Method parameters Titer determination:

Method data overall view

Method name:	Titre HCl	Created at:	09/13/12 14:23:02
Method type:	Automatic titration	Last modification:	09/13/12 14:27:56
Measured value:	pH	Damping settings:	None
Titration mode:	Dynamic	Documentation:	GLP
Dynamic:	Steep		
Measuring speed / drift:	Normal:	minimum holding time:	02 s
		maximum holding time:	15 s
		Measuring time:	02 s
		Drift:	20 mV/min
Initial waiting time:	0 s		
Titration direction:	Decrease		
Pretitration:	Off		
End value:	2.500 pH		
EQ:	On (1)		
Slope value:	Steep	Value:	700

Dosing parameter

Dosing speed:	100 %	Filling speed:	30 s
Maximum dosing volume:	50.00 ml		

Unit values

Unit size:	20ml
Unit ID:	10039005
Reagent:	HCl 0.1 mol/L
Batch ID:	no Charge
Concentration [mol/l]:	0.10070
Determined at:	12/05/11 19:18:45
Expire date:	08/18/12
Opened/compounded:	09/10/11
Test according ISO 8655:	05/10/11
Last modification:	09/13/12 14:35:18

Device information

Device:	TitroLine 7000
Serial number:	00012
Software version:	1230

Titre_HCl_13_09_12-14_36_21.pdf 2/2

Application

Titration of the sample

Weigh the sample exactly (0.001 g, please refer to the table) in a erlenmeyer flask with stopper and add a suitable solvent or solvent mixture to dissolve the sample (maybe under heating). Add now 25.00 ml of the KOH reagent and boil the sample for 30 min. using a water cooler

sap. no [mg KOH/g]	amount [g]
< 10	20
from 10 to 20	10
from 20 to 50	5
from 50 to 100	2.5
from 100 to 200	1.5
from 200 to 300	1
from 300 to 500	0.5
> 500	0.2

Titrate the warm sample immediately. Place the beaker on the magnetic stirrer, immerse the electrode and burette tip inside the solution and start the titration method. It is important that the electrode is deep enough inside the solution. For a 200 ml Erlenmeyer flask a solvent volume of at least 100 ml is necessary.

After the titration rinse the electrode and burette tip with solvent. For each set of samples perform a blank titration with all reagents and solvents but without the sample.

Result calculation

The enclosed titration example shows the calculation of the result in mg KOH /g sample (saponification number).

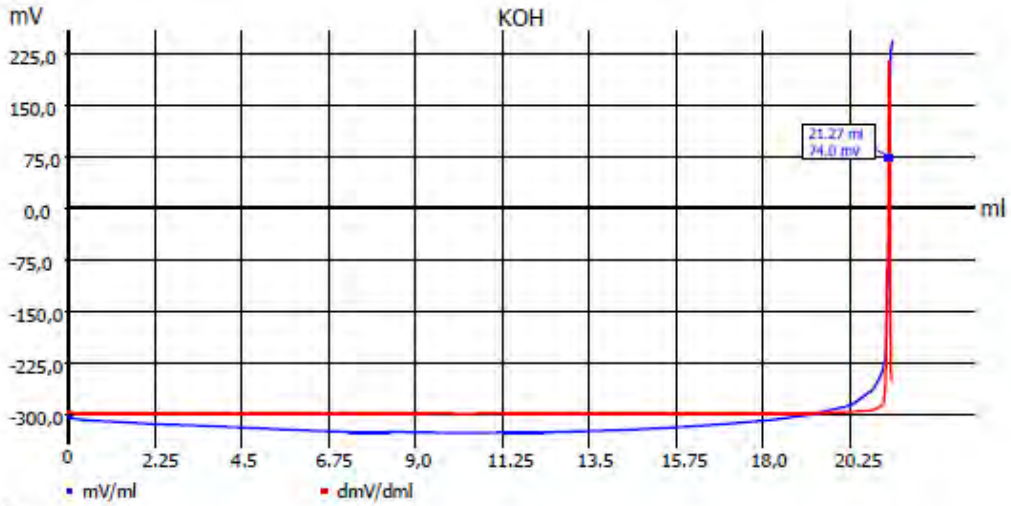
SP mgKOH/g = (B-EQ1) * 56.1 * T *1 /(1*W)

EQ1: ml consumption at the equivalence point
B: ml consumption for the blank titration
56.1: molecular weight of oleic acid in g/mol
T: concentration of the HCl (e.g.0.499 mol/l)
F1;F2 conversation factors.
W: sample weight in g

Blank titration page 1: Curve and result

GLP documentation

Titration graph



Method data

Method name:	Saponification Blank	Titration duration:	4 m 31 s
End date:	07.05.13	End time:	13:52:53

Titration data

Sample ID:	KOH	Weight:	1.00000 g
Start mV:	-300.1 mV	End mV:	242.7 mV
EQ:	21.265 ml / 74.0 mV	Blank:	21.27 ml

Calculation formula

Blank:	EQ1 -> M01
Statistics:	Off

Application

Blank titration page 2: method

Method data overall view

Method name:	Saponification Blank	Created at:	04/29/13 16:23:31
Method type:	Automatic titration	Last modification:	05/07/13 13:02:02
Measured value:	mV	Damping settings:	weak
Titration mode:	Dynamic	Documentation:	GLP
Dynamic:	Steep		
Measuring speed / drift:	User-defined:	minimum holding time:	03 s
		maximum holding time:	15 s
		Measuring time:	02 s
		Drift:	10 mV/min
Initial waiting time:	0 s		
Titration direction:	Increase		
Pretitration:	Off		
End value:	Off		
EQ:	On (1)		
Slope value:	Steep	Value:	700

Dosing parameter

Dosing speed:	100.00 %	Filling speed:	30 s
Maximum dosing volume:	50.00 ml		

Unit values

Unit size:	50ml
Unit ID:	10045002
Reagent:	HCl
Batch ID:	no entry
Concentration [mol/l]:	0.49990
Determined at:	05/06/13 22:10:36
Expire date:	09/29/12
Opened/compounded:	08/29/12
Test according ISO 8655:	06/01/12
Last modification:	05/06/13 15:47:29

Device information

Device:	TitroLine 7750
Serial number:	10018602
Software version:	1316

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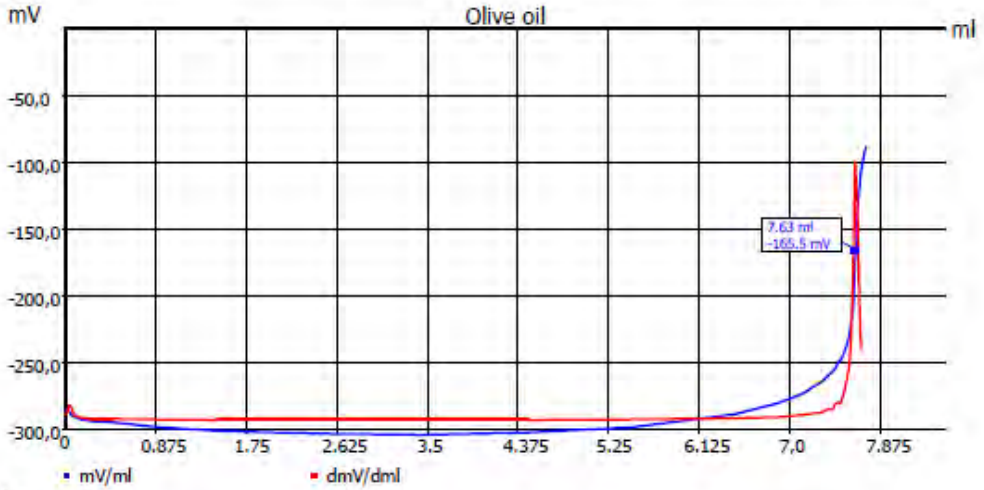
Sample titration page 1: Curve and result

GLP documentation

Titration graph



Method data

Method name:	Saponification Number	Titration duration:	4 m 4 s
End date:	07.05.13	End time:	16:09:09

Titration data

Sample ID:	Olive oil	Weight:	2.00140 g
Start mV:	-282.8 mV	End mV:	-88.2 mV
EQ:	7.634 ml / -165.5 mV	mg KOH/g:	191.35

Calculation formula

mg KOH/g:	(B-EQ1)*T*M*F1/(W*F2)	Mol (M):	56.10000
Blank value (B):	21.2900 ml (M01)	Titre (T):	0.49990000 (a)
Factor 1 (F1):	1.0000	Weight (W):	2.00140 g (m)
Factor 2 (F2):	1.0000	Statistics:	Off

Application

Sample titration page 2: method

Method data overall view

Method name:	Saponification Number	Created at:	04/29/13 16:34:15
Method type:	Automatic titration	Last modification:	05/07/13 15:21:59
Measured value:	mV	Damping settings:	None
Titration mode:	Dynamic	Documentation:	GLP
Dynamic:	Average		
Measuring speed / drift:	User-defined:	minimum holding time:	03 s
		maximum holding time:	15 s
		Measuring time:	02 s
		Drift:	10 mV/min
Initial waiting time:	0 s		
Titration direction:	Increase		
Pretitration:	Off		
End value:	Off		
EQ:	On (1)		
Slope value:	User-defined	Value:	250

Dosing parameter

Dosing speed:	100.00 %	Filling speed:	30 s
Maximum dosing volume:	50.00 ml		

Unit values

Unit size:	50ml
Unit ID:	10045002
Reagent:	HCl
Batch ID:	no entry
Concentration [mol/l]:	0.49990
Determined at:	05/06/13 22:10:36
Expire date:	09/29/12
Opened/compounded:	08/29/12
Test according ISO 8655:	06/01/12
Last modification:	05/06/13 15:47:29

Application

Notes

If you have any questions on the application, you can feel free to contact us..

优莱博技术（北京）有限公司

地址：北京市朝阳区酒仙桥东路1号院M8号楼C厅3层301室

☎Tel.：4008092068 🖷Fax：4008092068-112

💻E-Mail：info@julabo.cn

Web：www.julabo.cn