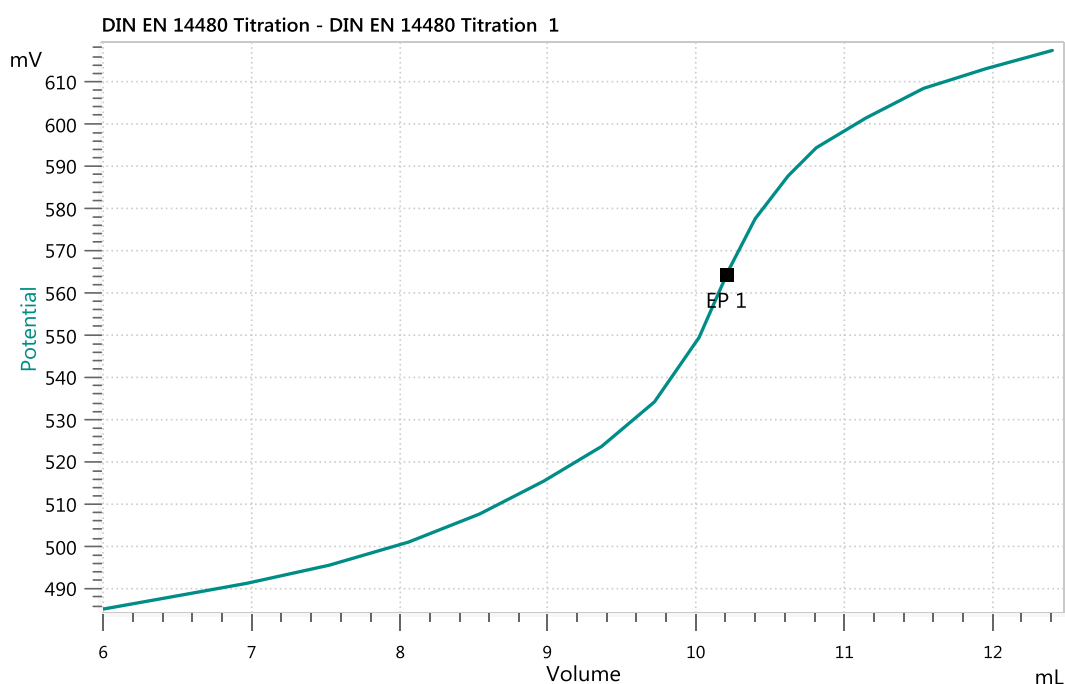


Determination of anionic surface active agents by potentiometric two-phase titration according to EN 14480



Anionic surfactants represent, by volume, the most important group of surfactants used in cleaning products. The potentiometric two-phase titration is a universal method for the accurate and fast determination of them.

Using the Surfactrode Refill, the anionic surfactants are determined by potentiometric titration with hyamine as titrant.

Method description

Sample

Detergent (powder)
Shampoo
Hand soap (liquid)

Sample preparation

5 g to 10 g sample is weighed into a 250 mL volumetric flask. The sample is dissolved in approximately 100 mL deionized water and the flask is then filled up to the mark with deionized water.

Configuration

OMNIS Sample Robot S with one Pick&Place module and pump module (2-channel)	2.1010.1010
OMNIS Titrator Advanced without stirrer	2.1001.0210
OMNIS Dosing Module without stirrer	2.1003.0010
OMNIS 20 mL cylinder unit, 2x	6.03001.220
Analog measuring module	6.02101.010
Electrode cable plug-in head G / plug P, 1.5 m, 2x	6.02104.010
Stirring propeller 30 mm ETFE	6.01900.010
Cable MDL PL/SO 0.5 m	6.02102.010
OMNIS Stand-alone license (including one instrument license)	6.06003.010
OMNIS instrument license, 1x	6.06002.010
Surfactrode Refill	6.0507.140
Viscotrode	6.0239.100

Solutions

Titrant	c(Hyamine) = 0.005 mol/L, if possible this solution should be bought from a supplier.
Solvent mixture	MIBK / EtOH, Φ (MIBK) = 50% (v/v), Φ (EtOH) = 50% (v/v) 500 mL MIBK and 500 mL EtOH are added into a 1000 mL volumetric flask and mixed well.
Hydrochloric acid	c(HCl) = 0.5 mol/L, if possible this solution should be bought from a supplier.

Analysis

10 mL sample solution is pipetted into the sample beaker. While stirring, approximately 70 mL deionized water is added using the pump and then the pH value is adjusted by a SET pH titration to 3.0 with c(HCl) = 0.5 mol/L.

After pipetting 20 mL solvent mixture as well as 0.2 mL TEGO add, the emulsion is stirred for 60 s. Afterwards the solution is titrated at the maximum stirring speed with c(Hyamine) = 0.005 mol/L until after the equivalence point.

After each titration, the solution is aspirated and the buret tips as well as the electrodes are first rinsed with deionized water and then, in a second beaker, dipped for 20 s in ethanol while stirring.

Parameters

SET pH

Mode	SET pH
Pause	10 s
Start volume	0 mL
Stirring rate	10
Endpoint at pH	3.0
Control range pH	2.0
Stop criterion	Stop drift
Stop drift	20 μ L/min
Stop volume	20 mL

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Method description

DET U

Mode	DET U
Pause	30 s
Start volume	0.02 mL
Stirring rate	15
Signal drift	10 mV/min
Min. waiting time	0 s
Max. waiting time	120 s
Meas. point distance	0
Min. increment	150 µL
Max. increment	Unlimited
Dosing rate	Maximum
Stop volume	20 mL
Stop EP	1
Volume after EP	2 mL
EP criterion	5
EP recognition	Greatest

Results

Sample (n = 6)	Anionic surfactants / mmol / 100 g sample	s(rel) / %
Detergent	18.11	0.8
Shampoo	24.61	0.9
Hand soap	15.72	0.8