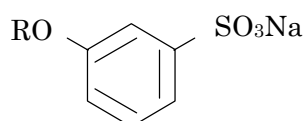


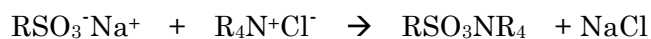
AQUACOUNTER Application Sheet	COM series	DATA No. C1	1st edition
Cosmetics	Quantification of anionic surfactants in liquid synthetic detergent using surfactant electrode		

1. Measurement outline

Anionic surfactants (sodium alkylbenzene sulfonate) in detergents are quantified by potentiometric titration with cationic surfactants. The end points were detected by surfactant electrode.



Sodium alkylbenzene sulfonate (LAS) C=12



R : Surface-active agent carbon chain

R₄N⁺ : Hyamine ion

2. Reagents and Electrodes

(1) Reagents	Titrant	0.05mol/L Hyamine 1622 manufactured by Orion.
	Standard for titrant	0.01mol/L sodium lauryl sulfate (SLS) (Orion)
	Additive	Triton X-100 (Orion)
	pH adjuster	1mol/L citric acid solution
	Electrode cleaner	0.1mol/L hydrochloric acid solution
(2) Electrodes	Indicator electrode	Surfactant electrode (Orion 93-42BN) to IE jack
	Reference electrode	Double Junction Reference Electrode (Orion 90-02) to RE jack *3mol/L potassium chloride solution was used as the external solution. Silver reference electrode RE-241 (P/N D230096-A) is also applicable.

3. Measurement conditions example (for COM-1600S)

Master File No.1	
Condition file: 1	
Parameters for Condition file 1	
Method	AUTO
Amp No.	2
Buret No.	1
Meas Unit	mV
S-Timer	10 sec
CP	0 mL
DP	0.10 mL
Direction	N/A
End Sens	500
Over mL	0 mL
Max Vol	20 mL
Mode No.	18
Unit	%
Formula	$(D-B) \times K \times F \times M / (S \times 10)$
Blank	0
Molarity	0.05
Factor	Titer of the titrant
K	323.24 (as LAS)

Mode No.18	
Pre Int	0 sec
Del K	0
Del Sens	0 mV
Int Time	3 sec
Int Sens	3 mV
Brst Speed	2
Pulse	40

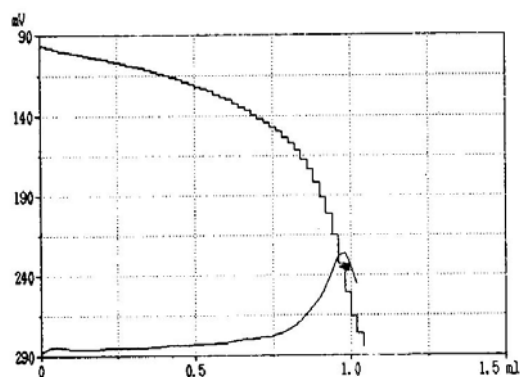
4. Procedure

Before starting measurements, dip electrodes into 0.01mol/L sodium lauryl sulfate for 10 minutes.

- 1) Introduce an appropriate portion of sample into a 100-mL beaker and add 50mL of deionized water.
- 2) Add 1mL pH adjuster to adjust approximately pH3. Then add 1mL of Triton X-100 (Orion)
- 3) Titrate with Hyamine (benzethonium chloride).

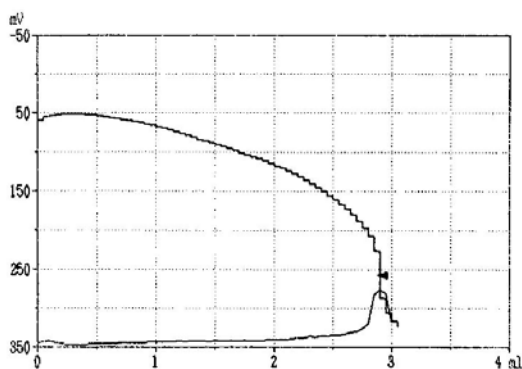
* Following a titration, first wash the electrodes with water, and then dip the electrodes into HCl solution with stirring. Then rinse again with water before starting next measurement.

5. Measurement example



Standardization of Hyamine

Sample No.	Sample volume (mL)	Titration value (mL)	Titre/Factor
1	5	0.960	1.044
2	5	0.962	1.041
3	5	0.963	1.042
Avg. (Average value)			1.042
Std. Dev. (Standard Deviation)			0.001
C.V. (Coefficient of variation)			0.10 %



Sample measurement results

Sample No.	Sample volume (g)	Titration value (mL)	Content (%)
1	0.0764	2.855	62.93
2	0.0789	2.868	63.22
3	0.0792	2.877	63.42
Avg. (Average value)			63.19 %
Std. Dev. (Standard Deviation)			0.25 %
C.V. (Coefficient of variation)			0.40 %

6. Note

- 1) Some detergents may contain substances adhere to the electrode which causes instability in potential. The size of sample is adjusted so as to titrate with approximately 1mL of titrant.
- 2) In order to activate the electrodes, soak the electrodes into doubling dilution of Hyamine for about 30 minutes. Then soak them into 0.005mol/L hydrochloric acid for 1 hour and then successively in 100-fold dilution of SLS solution about 10 minutes.

Key words

Detergent, anionic detergent, surfactant electrode, Hyamine, sodium alkylbenzene sulfonate, sodium lauryl sulfate, JIS K3362

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