Thermo. Titr. Application Note No. H-039

Title:	**Determination of Sodium Lauryl Ether Sulfate**

***Scope*:**	Determination of sodium lauryl ether sulfate surfactants

***Principle*:**	Titration of anionic sodium lauryl ether sulfate (SLES) surfactants with a standardized solution of cationic cetyl pyridinium chloride (CPC). The reaction is mildly exothermic. The titrant must be previously standardized against a solution of pure sodium dodecyl sulfate. For results of highest accuracy, it is necessary to determine a method blank for each product type under investigation.

Reagents:	0.7 mol/L cetyl pyridinium chloride solution (standardized). Weigh 240 g cetyl pyridinium chloride into a beaker. Add 125mL propan-2-ol, and make to approximately 700mL with DI water. Mix until dissolved, and transfer to a 1000mL volumetric flask, making to volume with DI water. Acetone, A.R.

Method:	Basic Experimental Parameters:	
	Titrant delivery rate (mL/min.)	2
	No. of exothermic endpoints	1
	Data smoothing factor	60
	Stirring speed (802 stirrer)	10
	Delay before start (secs.)	15
	The amount of sample taken for analysis will depend on the anticipated SLES concentration. In the example of an SLES product illustrated here, the content was approximately 60%. In this instance, approximately 7g of sample is accurately weighed into a 200mL volumetric flask, and 15mL acetone added. The flask is made to volume with DI water, and a magnetic spin bar added. The flask is stoppered and placed on a magnetic stirrer and agitated until all sample has been completely dissolved.	
	Titrate a 30mL aliquot to a single exothermic endpoint. The addition of acetone modifies the effect of micelles on the titration curve. Propan-2-ol or acetonitrile can also be used for micelle modification, but the amount required might be different to the amount of acetone specified here.	

Results	Example: “Sulfotex 60/40”
	Assumed formula weight for commercial sodium lauryl ether sulfate = 384 Content = 62.1 ± 0.12% (n=6)

Calculation:

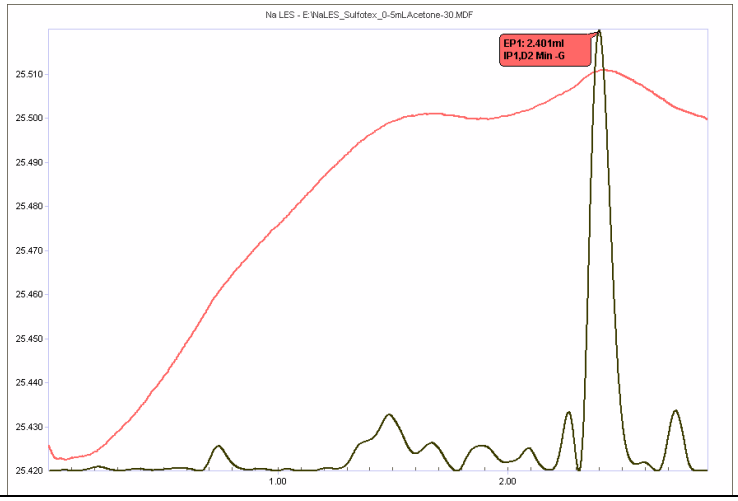
$$\%\text{SLES} = \frac{((\text{mL titre} - \text{mL blank}) \times \text{M CPC} \times 384 \times 100)}{(\text{sample mass, g} \times 1000)}$$

Thermometric Titration Plot:

Legend:

Red = solution temperature curve

Black =second derivative curve



Determination of method blank:

Method blank = y-intercept =0.0928mL