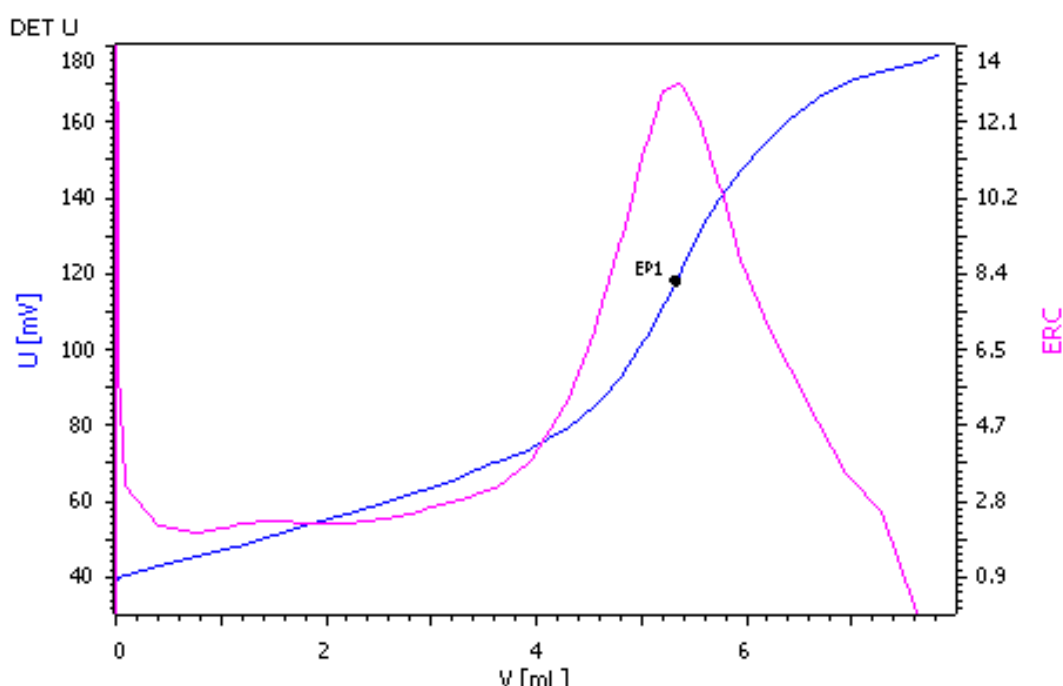


# Determination of dialkyl dimethyl quaternary ammonium salts in fabric softener according to ASTM D5070



Quaternary ammonium salts are the active ingredients in fabric softener and require accurate determination to assess the cost and the performance of the fabric softener. This Application Note describes the determination of dialkyl dimethyl quaternary ammonium salts by back titration.

# Method description

## Sample

Fabric softener

## Sample preparation

Approx. 1.8 g of sample is weighed accurately and dissolved in 200 mL isopropanol.

## Analysis of samples

2 mL sample is pipetted into a 250 mL beaker and 5 mL isopropanol is added. After dissolution, approximately 150 mL of deion. water and 4 mL of the borate buffer solution are added. Additionally 10 mL  $c(\text{SDS}) = 0.004 \text{ mol/L}$  is dosed to the solution and the titration is carried out using  $c(\text{Hyamine}) = 0.004 \text{ mol/L}$  until after the equivalence point.

## Configuration

905 Titrand	2.905.0010
Tiamo 2.5 full	6.6056.252
Dosino 800 (2x)	2.800.0010
Stirrer 801	2.801.0040
10 mL dosing unit (2x)	6.3032.210
Electrode cable/1m/F	6.2104.020
Combined nitrate ion-selective electrode	6.00510.120

## Parameters

Mode	DET U
Pause	30 s
Start volume	0 mL
Stirring rate	6
Min. increment	10 $\mu\text{L}$
Max. increment	off
Signal drift	20 mV/min
Max. waiting time	38 s
Min. waiting time	5 s
Dosing rate	max.
Stop volume	10 mL
EP criterion	10
EP recognition	greatest

## Solutions

Sodium lauryl sulfate solution	$c(\text{SDS}) = 0.004 \text{ mol/L}$ 1.15 g $\text{C}_{12}\text{H}_{25}\text{NaO}_4\text{S}$ is weighed into a 1 L volumetric flask and dissolved in deion. water. The flask is then filled up to the mark with deion. water
Hyamine 1622 Solution	$c(\text{C}_{27}\text{H}_{42}\text{ClNO}) = 0.004 \text{ mol/L}$ 1.85 $\pm$ 0.5 g Hyamine is dissolved in deion. water, transferred to a 1 L volumetric flask, and filled up to the mark with deion. water.
Borate Puffer	In a 500 mL beaker 5.0 g of sodium borate decahydrate and 7.0 g of boric acid are dissolved in approximately 300 mL deion. water. While stirring the pH is adjusted with $w(\text{H}_2\text{SO}_4) = 5\%$ to pH 6. The solution is transferred to a 500 mL volumetric flask, mixed and filled up to the mark with deion. water.

## Result

$W_{\text{active}} (n = 5)$	$s_{\text{rel}} (\%)$
64.1%	0.4