



**Overview**

Amine concentration in activated N-methyl diethanol amine was determined using the first derivative titration technique on ORION 960 Titrator with model 8172BN pH electrode and 0.5 N HCl as a titrant.

<b>Market</b>	Chemical	<b>Species Measured</b>	Amine
<b>Sample</b>	N-Methyl Diethanol Amine	<b>Sample Size</b>	1 g
<b>Technique #</b>	6 First derivative	<b>Typical Concentration</b>	37%
		<b>Electrode</b>	model 8172BN pH electrode
<b>Solutions</b>	0.5 N HCl (Titrant), ROSS reference filling solution, Cat. No. 810007, Electrode storage solution, Cat. No. 910001, pH buffer 4.01, 910104 and pH buffer 7.00, 910107.		
<b>Solutions preparation:</b>	To prepare 0.5 M HCl, measure about 41 mL of concentrated HCl into 1 L volumetric flask. Add DI water to the mark.		
<b>Titrant standardization</b>	Standardize 0.5 M HCl by titrating 15 mL of 0.1 M Sodium Bicarbonate standard (Orion 950206).		
<b>Sample Prep</b>	Accurately weigh about 1g of the product into a 100 mL beaker and record the weight. Add 50 mL of the DI water. Mix well.		

**Statistics**

**# of Trials** 4      **Mean** 39.95%      **%CV** 0.05      **Analysis Time** 9 minutes

**Comments** Rinse the electrodes, stirrer, and dispenser probe thoroughly between measurements with deionized water.

**Method Parameters**

<b>Sample Volume/Weight</b>	1.0 g	<b>Timed or Stability Readings</b>	10.0 second(s) timed
<b>Constant Increment</b>	10.0 mV	<b>Number of Endpoints</b>	1
<b>Max Titrant Volume</b>	12.0 mL	<b>Desired Units</b>	% w/w
<b>Molecular weight</b>	92.6	<b>Predose</b>	none
<b>Prestir</b>	1 second	<b>Additional Parameters</b>	
<b>Reaction Ratio</b>	1		



# Thermo

ELECTRON CORPORATION

Potentiometric Titration Application Notes

Applications Log # 691

Results

METHOD 16 SUMMARY

SAMPLE ID NUMBER: 6  
 TEST: Amure cone.  
 SITE: \_\_\_\_\_  
 ANALYST: \_\_\_\_\_  
 17:01 01-24-05 ELECTRODE: 1:pH  
 TECHNIQUE 6 FIRST DERIVATIVE  
 SAMPLE WEIGHT 1.04500 g  
 TITRANT 0.5058 M of HCL  
 PRE-DOSE VOLUME 6.988 mL  
 CONST INCREMENT 10.0 mL  
 MAX TITRANT VOL 12.000 mL  
 TIMED READINGS 10.0 sec.  
 PRESTIR 1.0 sec.  
 CONTINUOUS STIRRING  
 REACTION RATIO 1.0000  
 MOLECULAR WEIGHT 92.60  
 CAL CONSTANT 1.00543

electrode check: +/- 0.6 mV

0	v= 6.988 mL	E= 39.7 mV
		pH= 6.44
1	v= 7.038 mL	E= 47.1 mV
		pH= 6.31
2	v= 7.088 mL	E= 52.5 mV
		pH= 6.22
3	v= 7.239 mL	E= 64.3 mV
		pH= 6.02
4	v= 7.390 mL	E= 74.5 mV
		pH= 5.84
5	v= 7.541 mL	E= 84.4 mV
		pH= 5.67
6	v= 7.692 mL	E= 94.9 mV
		pH= 5.49
7	v= 7.842 mL	E= 106.8 mV
		pH= 5.29
8	v= 7.943 mL	E= 116.6 mV
		pH= 5.12
9	v= 8.043 mL	E= 128.2 mV
		pH= 4.90
10	v= 8.094 mL	E= 137.6 mV
		pH= 4.76
11	v= 8.144 mL	E= 148.6 mV
		pH= 4.57
12	v= 8.194 mL	E= 164.8 mV
		pH= 4.29
13	v= 8.245 mL	E= 190.1 mV
		pH= 3.86
14	v= 8.295 mL	E= 215.3 mV
		pH= 3.43
15	v= 8.345 mL	E= 230.9 mV
		pH= 3.18
16	v= 8.395 mL	E= 241.1 mV
		pH= 2.98
17	v= 8.448 mL	E= 248.4 mV
		pH= 2.86
18	v= 8.546 mL	E= 258.9 mV
		pH= 2.68
19	v= 8.697 mL	E= 269.1 mV
		pH= 2.50
20	v= 8.898 mL	E= 278.3 mV

8.8 min

FIRST DERIVATIVE ANALYSIS

0	dE/dv= 147.2	d2E/dv2= -395.7
1	dE/dv= 127.3	d2E/dv2= -613.3
2	dE/dv= 85.5	d2E/dv2= -270.4
3	dE/dv= 72.9	d2E/dv2= -62.7
4	dE/dv= 66.6	d2E/dv2= -17.6
5	dE/dv= 67.6	d2E/dv2= 25.3
6	dE/dv= 74.3	d2E/dv2= 62.0
7	dE/dv= 86.3	d2E/dv2= 147.7
8	dE/dv= 111.4	d2E/dv2= 263.1
9	dE/dv= 139.2	d2E/dv2= 540.8
10	dE/dv= 193.0	d2E/dv2= 1305.8
11	dE/dv= 270.5	d2E/dv2= 2186.2
12	dE/dv= 412.8	d2E/dv2= 2304.9
13	dE/dv= 502.3	d2E/dv2= -69.2
14	dE/dv= 405.8	d2E/dv2= -2443.4
15	dE/dv= 256.6	d2E/dv2= -2304.9
16	dE/dv= 174.1	d2E/dv2= -1384.9
17	dE/dv= 117.4	d2E/dv2= -608.0
18	dE/dv= 82.4	d2E/dv2= -246.5
19	dE/dv= 55.4	d2E/dv2= -128.3
20	dE/dv= 37.2	d2E/dv2= -60.1
21	dE/dv= 25.2	d2E/dv2= -27.1
22	dE/dv= 16.8	d2E/dv2= -12.1
23	dE/dv= 11.2	d2E/dv2= -4.9
24	dE/dv= 8.4	d2E/dv2= -2.5
25	dE/dv= 7.0	d2E/dv2= -2.1

SAMPLE = 36.95 % w/w ✓  
 END POINT VOL = 8.244 mL (189.6 mV)  
 (pH 3.87)

Excess Titre= 3.771 mL

Signal/Noise= 7

