

Content Determination of Aspartame

Method for the acidimetric content determination of Aspartame in a non-aqueous medium

Sample	Aspartame C ₁₄ H ₁₈ N ₂ O ₅	Preparation and Procedures Weigh a sample of 0.24 to 0.25 g Aspartame, accurately to 0.1 mg, in a titration beaker. Pipette 1.5 mL of anhydrous formic acid into the beaker and dissolve the sample. Finally add 50 mL of acetic acid 98%.
Substance	Aspartame, M = 294.3 g/mol	
Chemicals	Acetic acid 98% R, Formic acid, anhydrous R	
Titrant	c(HClO ₄) = 0.1 mol/L	
Standard	THAM Tris-hydroxymethyl	
Instruments	DL70ES/DL77 and DL58/55+/53+	
Accessories	Titration beaker ME-101974 Temperature sensor DT120 SP250 Peristaltic pump Rondo60 Sample changer	
Indication	DG 113-SC	
Chemistry		
Calculation	$R(\%) = (Q \cdot H5 \cdot M/10 \cdot m) + H20$ <p>Q = Titrant consumption in mmol M = Molar mass Aspartame m = Sample size in g H5 = Volume correction factor H20 = % Loss on drying of Aspartame</p>	
Waste disposal	Halogen-containing organic solvents waste.	
Author	L. Pludra	Remarks The previously determined loss on drying content is saved as the auxiliary value H20. As a result of the high expansion coefficient of the perchloric acid solution, its temperature is measured during standardisation (H16) and titration (T) and a correction factor (H5) is then calculated.

Results

METTLER DL77 Titrator V3.1 Dr. Kade Pharm. Fabrik GmbH
 Tante Elfriede Quality Control laboratory

Method: G082 Cont. Aspartame Date: 19-11-1999 11:36
 User: **Pludra** Measured: 19-11-1999 11:51

RESULTS

No.	ID1	Sample size and results			
1/1	970820	0.2456 g	R1 = 99.08	%	C14H18N2O5
1/2	970820	0.2442 g	R1 = 98.86	%	C14H18N2O5
1/3	970820	0.2435 g	R1 = 98.66	%	C14H18N2O5
1/4	970820	0.2426 g	R1 = 98.62	%	C14H18N2O5
1/5	970820	0.2493 g	R1 = 98.55	%	C14H18N2O5
1/6	970820	0.2469 g	R1 = 98.54	%	C14H18N2O5
			R2 = 22.6	°C	T Titer det.
			R3 = 21.7	°C	T measured

STATISTICS

Number of results R1	n = 6	
Mean value	= 98.72	% C14H18N2O5
Standard deviation	s = 0.211833	% C14H18N2O5
Rel. standard deviation	srel = 0.215	%

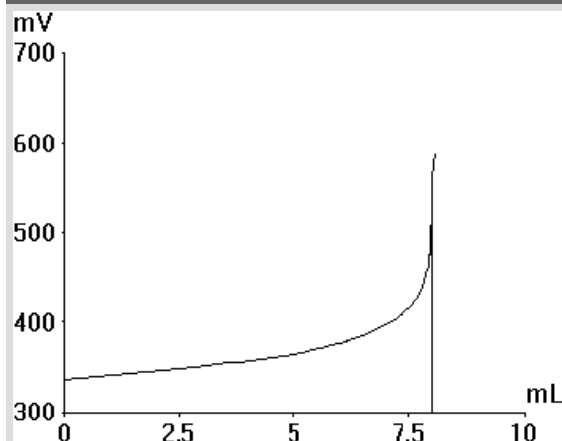
AUXILIARY VALUE

H5 = 1.001001 Volume corr. factor

Table of measured values

EQP	ET	Volumen mL	Signal mV	1. Ableit. mV/mL	Zeit min:s
	ET1	0.0000	336.1		0:03
		2.8570	348.9	4.5	0:16
		4.2850	358.7	6.9	0:26
	ET2	5.0000	365.0	8.8	0:34
		5.2000	367.0	9.8	0:38
		5.4000	369.5	12.3	0:43
		5.6000	371.5	10.2	0:46
		5.8000	374.4	14.7	0:52
		6.0000	377.2	14.0	0:57
		6.2000	380.0	14.0	1:01
		6.4000	383.6	17.9	1:07
		6.6000	387.4	19.3	1:13
		6.8000	391.7	21.4	1:19
		7.0000	396.8	25.5	1:26
		7.2000	402.5	28.3	1:32
		7.4000	410.5	39.9	1:40
		7.5550	419.0	55.1	1:48
		7.6680	427.2	72.5	1:57
		7.7570	435.4	92.0	2:05
		7.8280	445.0	135.1	2:13
		7.8720	453.5	194.1	2:21
		7.9030	461.8	266.4	2:28
		7.9260	469.1	319.6	2:36
		7.9470	479.1	476.7	2:44
		7.9670	494.0	742.0	2:54
		7.9870	523.6	1480.5	3:08
EQP1		8.0070	559.5	1795.5	3:21
		8.0270	577.4	896.0	3:32
		8.0470	589.0	581.0	3:41

Titration curve



Method

Method: G082 Content Aspartame
Version: 19-11-1999 11:36

Title
Method ID G082
Title Content Aspartame
Date/time 19-Nov-1999 11:36

Temperature
Sensor TEMP A
Unit of meas. oC
dT [oC,oF,K] 0.02
dt [s] 2.0
t(min) mode Fix
t(min) [s] 3.0
t(max) [s] 30.0

Sample
Number samples 3
Titration stand ST20 1
Entry type Weight m
Lower limit [g] 0.24
Upper limit [g] 0.25
ID1
Molar mass M 294.3
Equivalent number z 1
Temperature sensor TEMP A

Stir
Speed [%] 50
Time [s] 10

Titration
Titrant HC104
Concentration [mol/L] 0.1
Sensor DG113-SC
Unit of meas. mV
Titration mode EQP
Predispensing 1 mL
Volume [mL] 5
Titrant addition DYN
dE(set) [mV] 8.0
Limits dV Absolute
dV(min) [mL] 0.02
dV(max) [mL] 0.2
Measure mode EQU
dE [mV] 0.5
dt [s] 1.0
t(min) [s] 3.0
t(max) [s] 30.0
Threshold 250.0
Maximum volume [mL] 10.0
Termination after n EQPs Yes
n = 1
Evaluation procedure Standard
Stop for reevaluation Yes
Condition neq=0

Auxiliary value
ID text Volume corr. factor
Formula $H5=1+(H16-T)*0.0011$

Calculation
Result name C30H40C12N4
Formula $R=(Q*H5*C/m)+H19$
Constant $C=M/(10*z)$
Result unit %
Decimal places 2

Rinse
Auxiliary reagent CH3COOH
Volume [mL] 20.0

Record
Output unit Computer
Raw results last sample Yes
Table of values Yes
E - V curve Yes

Statistics
Ri (i=index) R1
Standard deviation s Yes
Rel. standard deviation srel Yes

Calculation
Result name T Titer det.
Formula $R2=H16$
Constant
Result unit oC
Decimal places 1

Calculation
Result name T measured
Formula $R3=T$
Constant
Result unit oC
Decimal places 1

Record
Output unit Printer
All results Yes