

Inorganic
Chemical

Purity of Salicylic Acid

Acid· base titration by
Automatic Potentiometric Titrator

Standard

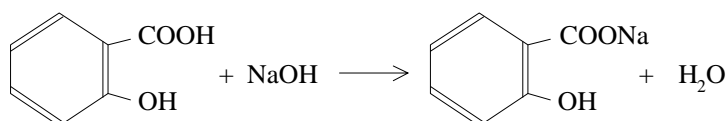
JIS K 8392

1. Abstract

Purity of Salicylic acid is determined according to JIS K 8392-1994 Salicylic Acid (Reagent).

After Ethanol and pure water without containing carbon dioxide to the test sample, titrate with 0.1mol/L Sodium hydroxide up to the endpoint, which is the maximum inflexion on titration curve.

The purity of Salicylic acid is calculated from titration volume of Sodium hydroxide.



2. Reference

- 1) 「JIS K 8392-1994 Salicylic Acid (Reagent)」

3. Cautions in measurement

- 1) Use pure water which does not contain carbon dioxide.
- 2) Use a titration cell for trace detection because of small amount of pure water to be added.

4. Post-measurement care

After the electrode is rinsed with water, keep it dipped in pure water in order to avoid its tip drying up.

5. Test equipment

Main unit : Automatic potentiometric titrator (Standard preamplifier STD—)
Electrode : Option Trace type Combination glass electrode
 Standard Temperature compensation electrode
Option : Trace type titration cell unit

6. Reagent

Titrant : 0.1mol/L Sodium hydroxide
Additive : Ethanol, Pure water

7. Measurement procedure

—Measurement—

- 1) Sample precisely 0.5g into the cell.
- 2) Add 5mL Ethanol and 30mL pure water.
- 3) Titrate with 0.1mol/L Sodium hydroxide to obtain the purity of Salicylic acid.

8. Formula

Purity of Salicylic acid (%) = (EPl - BLl) × TF × C1 × K1 / SIZE

EPl : Titration volume (mL)
BLl : Blank level (0.00mL)
TF : Factor of titrant (0.9897)
C1 : Concentration conversion coefficient (13.813mg/mL)
(Salicylic acid in mg equivalent to 1mL of 0.1mol/L NaOH)
K1 : Unit conversion coefficient (0.1)
SIZE : Sample size (g)

9. Example of measurement

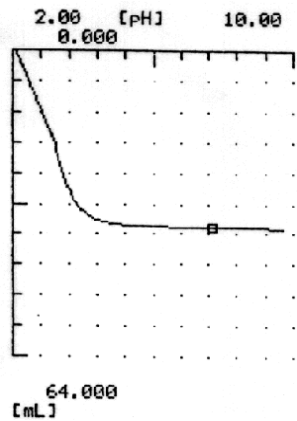
— Ambient condition —

Room temperature : 23 °C	Humidity : 47 %	Weather : Cloudy
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-Titration parameter-

Model : AT-510	
Method No. : 15	
Titration mode : Auto	
Intermit	
Titration form : EP Stop	
[Titration parameter]	[Result parameter]
Form : EP Stop	<Calculation>
APB No. : 1	Calc.Type : Sample
Unit No. : 1	Conc.1 : Set
Detector No. : 1	CO1=
Unit : pH	(EP1-BL1)*TF*C1*K1/SIZ
Max. Volume : 60.0mL	E
Wait Time : 15s	Unit : %
Direction : Auto	EP No. : 1
	Temp.Comp. : Off
[Control parameter]	<Constant>
End Point No. : 1	C1 : 13.813
End Sense : Auto	K1 : 0.1
End Point Area : Off	<Titr. Constant>
Separation : Off	Factor : 0.9897
Over Titr.Vol. : 0mL	<Blank>
Gain : 1	Blank1 : 0.00
Data samp.Pot. : 4.0mV	
Data samp.Vol. : 0.5mL	
Stability : 0.5mV/s	
Delay Time : 1s	
Limit Time : 30s	

-Titration curve-

*** Result ***
Sample No. : 72-01
Date : 1999/08/18 16:28
Sample ID :
Method No. : 15
<Auto Intermit>
Method Name :
Titration time : 00:12:53
Size : <u>0.5124g</u>
Conc-1 : <u>98.763%</u>
End point-1
Volume : <u>37.0179mL</u>
Potential : 7.73pH


(The above printout data were obtained from titration by AT-510)

«Titration parameter»

Form: of titration / APB No. the burette used in titration / Unit No.: [APB Unit File number](#)

Detector No.: the detector used in titration / Unit of potential / Max Volume: of titration

Wait Time: before titration starts / Direction.: of titration

«Control parameter»

End Point No.: number of EPs / End sense: of EP detection / End Point Area: EP detection area

Separation: of potential / Over Titr.Vol. over-titrated volume / Gain: sensitivity of detection signal

Data samp.Pot.: potential change of sampling signal / Data samp.Vol. : titration volume of sampling signal

Stability: of EP sense / Delay Time: before stability check / Limit Time: of stability

«Calculation parameter»

Calc.Type: of formula / Conc.1 formula 1 / Unit: of results / EP No. of calculation

Temp.Comp.: temperature compensation / C1: concentration conversion coefficient

K1: unit conversion coefficient / TF: factor of titration liquid / Blank1: blank level 1

–Measurement results–

n	Sample (g)	Titration (mL)	Salicylic acid(%)	Purity of Salicylic acid	
				Mean	SD
1	<u>0.5124</u>	<u>37.0179</u>	<u>98.763</u>	98.882 %	0.104 %
2	0.4989	36.1043	98.932		
3	0.4890	35.3950	98.952		
				RSD	0.105 %

*The above results were obtained by 3 tests of the same sample.

* Red underline shows the data from page 3/4.

10.Summary

Salicylic acid is a substance which possesses both Carboxyl group and Hydroxy group in Benzene ring. Rational formula: $C_6H_4(OH)COOH$, Molecular mass 138.13.

The test results show a good repeatability with 0.1% relative standard deviation.

Precise and reliable measurement is assured by the automated potentiometry.

Purity of Salicylic acid can be analyzed by any of the following titration systems manufactured by Kyoto Electronics (KEM).

【AT-610】



Awarded Product of Supreme Technology from Kyoto City

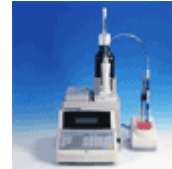
- Easy key entry by touch panel of large color LCD (8-inch wide)
- Simultaneous titration in parallel
- Both potentiometric and Karl Fischer moisture titration (coulometric + volumetric) can be performed at a time.

【AT-510】



- Compact and cost performance model
- PC card expands data memory for convenience and versatility.

【AT-500N-1】



- Low cost and high performance
- Easy view with back light LCD
- GLP/GMP conformed model

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