

Inorganic
Chemical

Purity of Benzoic Acid

Acid-base titration by
Automatic Potentiometric Titrator

Standard

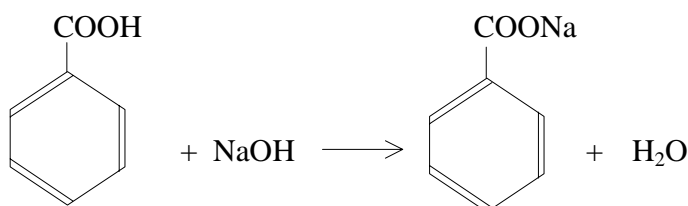
JIS K 8073

1. Abstract

Purity of Benzoic acid is measured according to standard testing method JIS K 8073-1992 Benzoic acid (Reagent).

Titrate with 0.1mol/L Sodium hydroxide after adding Ethanol and pure water.

Titration goes up to the endpoint, which is the maximum inflexion on titration curve. Purity of Benzoic acid can be calculated from titration volume of Sodium hydroxide.



2. Reference

- 1) JIS K 8073-1992 Benzoic acid (Reagent)

3. Cautions in measurement

- 1) Use pure water without carbon dioxide contained.
- 2) Use a trace type titration cell due to limited amount of water to be added.

4. Post-measurement care

After the electrode is rinsed with pure water, keep it dipped in a beaker filled with pure water 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 0.5g in a trace type titration cell.
- 2) Add 5mL Ethanol and 30mL pure water.
- 3) Titrate with 0.1mol/L Sodium hydroxide to obtain purity of Benzoic acid.

8. Formula

Purity of Benzoic 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 (12.212mg/mL)
(Benzoic acid in mg equivalent to 1mL of 1mol/L NaOH)
K1 : Unit conversion coefficient (0.1)
SIZE : Sample size (g)

9. Example of measurement

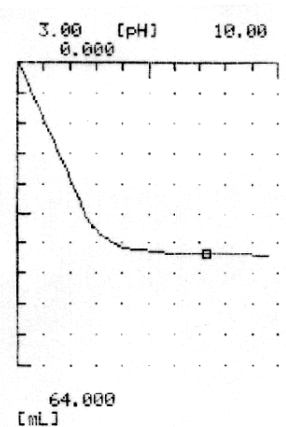
— Ambient condition —

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 : 12.212
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. : 71-01
Date : 1999/08/18 14:46
Sample ID :
Method No. : 15
<Auto Intermit>
Method Name :
Titration time : 00:10:19
Size : <u>0.4955g</u>
Conc-1 : <u>99.202%</u>
End point-1
Volume : <u>40.6698mL</u>
Potential : 8.08pH


(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 / Delay Time: before stability check / Limit Time: of stability check

«Calculation parameter»

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

Temp.Comp.: temperature compensation / C1(mg/mL): concentration conversion coefficient

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

–Measurement results–

n	Sample (g)	Titration (mL)	Benzoic acid(%)
1	<u>0.4955</u>	<u>40.6698</u>	<u>99.202</u>
2	0.4907	40.3759	99.448
3	0.5000	41.0843	99.311

Purity of Benzoic acid	
Mean	99.320 %
SD	0.123 %
RSD	0.124 %

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

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

10.Summary

Benzoic acid (Benzoessäure in German) is a carboxylic acid of aromatic compound having chemical structure of Benzene with a proton substituted by carboxyl group. Measurement results this time show favorable repeatability with 0.1% relative standard deviation. Precise and reliable measurement is assured by the automated potentiometry.

The purity of Benzoic acid can be perfectly measured by any of the following titration systems manufactured by Kyoto Electronics (KEM).

【AT-610】



Awarded Product of Supreme Technology from Kyoto City

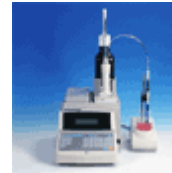
- Easy key entry by touch panel of large color LCD (8-inch wide)
- Simultaneous titration in parallel
- Both potentiometric and Karl Fischer moisture titration (coulometric·volumetric) can be performed at a time.

【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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