

Titration of Acidity in Sauces

Description

This method is used for the quantitative determination of the total acid content in ketchup, mayonnaise, mustard and sauces. The sample is titrated with 0.1 mol/L sodium hydroxide solution to a pH value of 8.2. To detect the total acidity of the sample, it must be dispersed as finely as possible. The total acidity is calculated in % acetic acid in.

Instruments

Titration	TL 5000, TL 7000, TL 7750 or TL 7800
Electrode	N 62, A 162 2M DIN ID or A 7780 1M-DIN-ID or similar
Cable	L 1A (only for electrodes with plug head)
Stirrer	Magnetic stirrer TM 235 or similar
Homogenizer	Polytron Pt 1200 or similar
Lab accessory	Glass beaker 150 mL
	Magnetic stirrer bar 30 mm

Reagents

1	Sodium hydroxide solution 0.1 mol/L
2	Buffer pH 4.00
3	Buffer pH 7.00
4	KCl solution 3 mol/L
5	Soda lime
All reagents should be of analytical grade or better.	

Titration procedure

Reagents

NaOH 0.1 mol/L

NaOH is available as a ready-to-use solution.

Caustic soda quickly absorbs CO₂ from the air and thus becomes unusable. The solution must therefore be protected from CO₂ with a CO₂ absorbent such as soda lime. For this purpose, a dry tube filled with soda lime is placed on the storage bottle.

The titer is determined as described in the application "Titer NaOH".

Cleaning and storage of the electrode

The electrode is cleaned with distilled water. KCl solution 3 mol/l is suitable for storing the electrode.

As this is a Endpoint Titration, the electrodes must be calibrated regularly (weekly). Two-point calibration with buffer pH 4.00 and pH 7.00 is recommended. After Calibration if the slope is <95% the electrodes must be replaced.

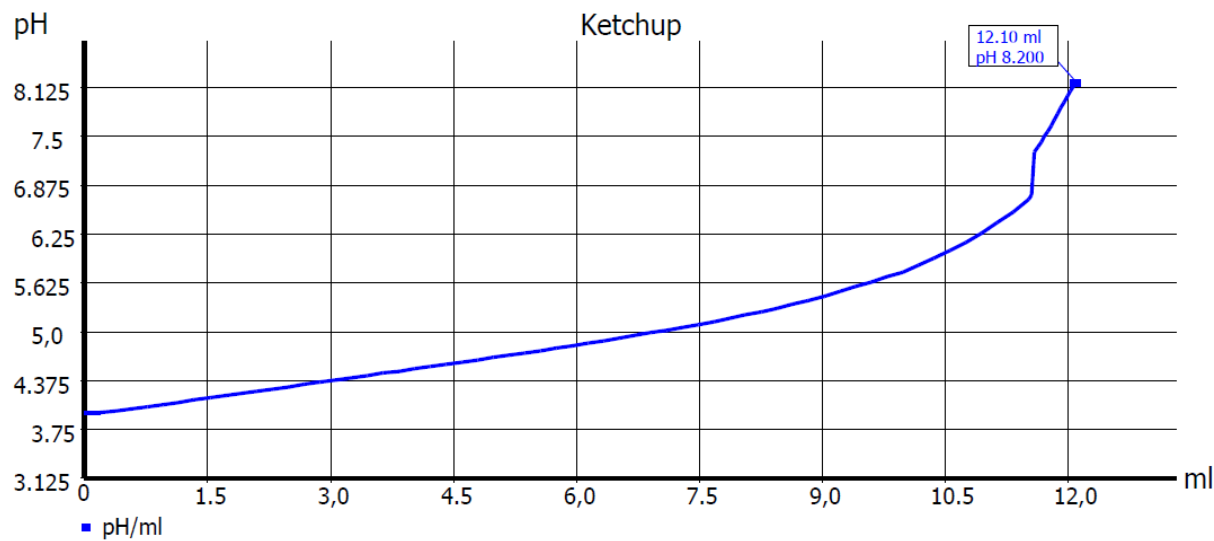
Sample preparation

2-10 g of sample is weighed in 150 ml beaker and made up to 60 – 80 mL with distilled water. The sample is stirred until it is finely divided. Depending on the sample, it may be necessary to homogenize it (e.g., with Polytron Pt 1200). The sample is titrated with sodium hydroxide 0.1 mol/L to the end point pH 8.2.

The consumption NaOH 0.1 mol/L should be about 5 - 15 mL, if necessary the sample amount has to be adjusted.

Titration parameter

Sample titration



Default method	Total Acidity		
Method type	Automatic titration		
Modus	Endpoint		
Measured value	pH		
Measuring speed / drift	normal	Minimum holding time	2 s
		Maximum holding time	15 s
		Measuring time	2 s
		Drift	20 mV/min
Initial waiting time	0 s		
Step size	0.05 mL		
Dampening	none	Titration direction	increase
Pretitration	Off	Delay time	0 s
Endpoint 1	pH 8.2	Delta Endpoint	pH 1.2
		Endpoint delay	5 s
Endpoint 2	Off		
Max. titration volume	20 mL		
Dosing speed	20%	Filling speed	30 s

Calculation:

The result is calculated as Acidity in % Acetic acid (HAc):

$$\text{Acidity \% HAc} = \frac{(EP1 - B) * T * M * F1}{W * F2}$$

EP1		Consumption of titrant at the end point
B	0	Blank value
T	WA	Actual concentration of the titrant
M	60.052	Molecular weight
W	m	Sample amount [g]
F1	0.1	Conversion factor
F2	1.0	Conversion factor