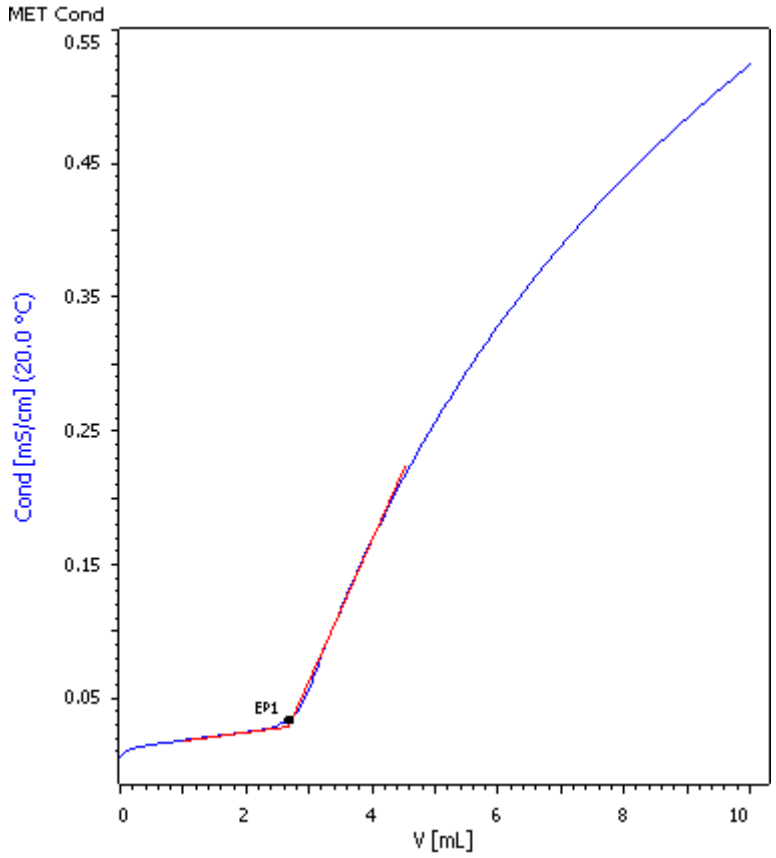
Titration Application Note T–154

Titration of alpha acids in hop products according to EBC 7.4



The content of alpha acids in hop draff was determined by conductometric titration with lead acetate as titrant and methanol as solvent.

Metrohm

Method description

Sample

Hop draff, hop pellets, and hop extracts

Sample preparation

Approx. 10 g of draff, pellets or extract are weighed out exactly to at least 0.1 mg into an Erlenmeyer flask and extracted over night with 100 mL toluene by stirring constantly.

Instruments

856 Conductivity module	2.856.0010
Bottle holder	6.2061.100
800 Dosino (2 x)	2.800.0010
20 mL Dosing unit (Titrant)	6.3032.220
50 mL Dosing unit (Solvent)	6.3032.250
802 Stirrer	2.802.0010
Sample beaker 120 mL	6.1459.307

Electrodes

Five-ring conductivity measuring cell, c = 0.7 cm^{-1}, with Pt1000	6.0915.100

Solutions

Titrant	Lead acetate solution: 20 g/L 20 g/L lead acetate ($Pb(CH_3COO)_2 * 3H_2O$) is dissolved in 1000 mL of methanol containing 0.5 mL glacial acetic acid.
Solvent	Methanol
Extracting agent	Toluene

Analysis

For titration, the five-ring conductivity measuring cell has to be used without the transparent cap on top. This is tolerable, because only the relative conductivity is here of interest, not the absolute conductivity.

For sample analysis of hop draff and hop pellets, 10 mL of the appropriate extract and 40 mL methanol are pipetted into a sample beaker and titrated with the lead acetate titrant. For the determination of hop extract, 1 mL of the prepared extract and 40 mL of the solvent are pipetted into a sample beaker and titrated with the lead acetate solution.

In-between measurements, the electrode is cleaned by rinsing with water.

Parameters

Mode	MET Cond
Pause	5 s
Signal drift	off
Min. waiting time	0 s
Max. waiting time	0 s
Volume increment	0.05 mL
Dosing rate	3 mL/min
Evaluation	without window
Smoothing	0

Results

Hop draff, mean result for n = 3

Alpha acid / %	0.6797
s(rel) / %	0.54

Hop pellets, mean result for n = 3

Alpha acid / %	6.1435
s(rel) / %	0.99

Hop extract, mean result for n = 3

Alpha acid / %	48.23
s(rel) / %	0.48