



Application Note AN-T-154

Determination of alpha acids in hops according to EBC 7.4

Conductometric titration to test hops for alpha acid content

Hops are a key ingredient in beer production, contributing not only bitterness but also to its aroma and flavor. The alpha acid level (AA%) in hops plays a major role in the bitterness they can impart. During boiling in the brewing process, alpha acids transform into iso-alpha acids which make the beer bitter. For this reason, it is important for brewers to know the exact AA value of the hops they use.

Different hop varieties contain varying amounts of alpha acids—even the same hop variety may exhibit different levels. This also depends on

factors such as growing conditions and harvesting time. The AA% can vary between 1% up to 20% in hops. Therefore, brewers maintain the consistency of their beer's flavor profile by accurately measuring and controlling the AA content.

This Application Note describes the determination of AA% in hops according to the EBC method 7.4. The hops are first extracted with toluene, then the alpha acid content in the extract is determined through a precipitation titration using conductometric methods.

SAMPLES

Dried hop pellets, Solero variety (16% AA)

EXPERIMENTAL

The hop pellets are first extracted with toluene. For the analysis, an aliquot of the prepared sample is pipetted into the sample beaker and then methanol is added. The solution is then

titrated with standardized lead acetate in methanol/glacial acetic acid until after the equivalence point (Figure 1).

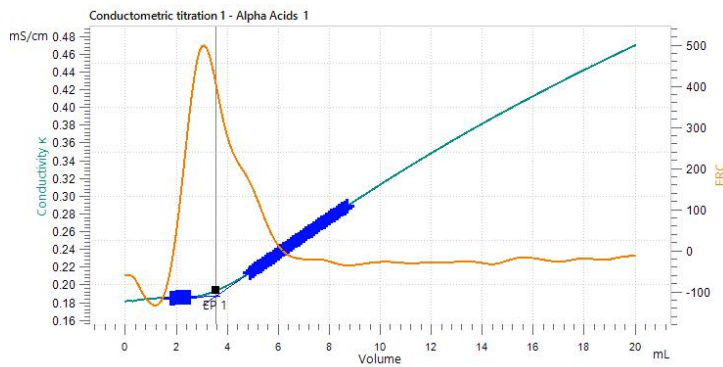


Figure 1. Example titration curve to determine alpha acid content in hop pellets.

RESULTS

The AA% could be reliably determined in hops with conductometric titration (Table 1).

Table 1. Results of the sample determination of alpha acid content in Solero hop pellets.

Sample	Result wt%	RSD in %
Solero	4.5	2.7

CONCLUSION

Alpha acid content in hop pellets can be easily determined by using conductivity titration according to EBC method 7.4. A significant advantage over other methods is the robust sensor used for the analysis. It is not influenced by external disturbances and is easy to clean.

This quality also simplifies implementing automation of the system.

The pellets' alpha acid content decreases over time. Therefore, this parameter should be measured again shortly before their use for the best results.

Internal reference: AW CH1-1116-122011

CONTACT

瑞士万通中国
北京市海淀区上地路1号院
1号楼7702
100085 北京

marketing@metrohm.com.cn

CONFIGURATION



OMNIS Titrator

新型、模式位分析 OMNIS Titrator 滴定,于独立行或作 OMNIS 滴定系的核心元件行。由于采用 3S 瓶配器技,理化学品从未像在一安全。可以使用量模和量管元自由配置滴定,并在需要展一台拌器。由于采用不同的件功能可,因此可以有不同量模式和功能。

- 通算机或本地网控制
- 可以其他用或助溶液外接最多四个滴定模或加液模
- 螺旋拌器的接方式
- 可提供不同大小的量管:5、10、20 或 50 mL
- 采用 3S 技的瓶配器:安全理化学品,自生商的原
始数据

量模式和件:

- 点定滴定:“Basic” 功能可
- 点和等当点滴定(一/):“Advanced” 功能可
- 点和等当点滴定(一/),包括平行滴定
:“Professional” 功能可

OMNIS

A WHOLE NEW LEVEL OF PERFORMANCE

功能可“率滴定”,用于 OMNIS Titrator
包含功能模式

- MET COND
- MEAS U / T / pH / COND
- 快量化液体理
- 使用一个 OMNIS Tritator 的内部滴定管行滴定



OMNIS Titrator 或滴定模的量通道,用于接。



$5 \text{ } c = 0.7 \text{ cm}^{-1} \text{ Pt}10000.65 \text{ m}$

池常数的 $5 \text{ } c = 0.7 \text{ cm}^{-1}$ (指数),集成有温度探
Pt1000 和固定 (0.65 m),用于接到 OMNIS 率量模上

。

感器用于量中等的率($5 \text{ } \mu\text{S}/\text{cm}$ 至 $20 \text{ mS}/\text{cm}$),例如:

- 用水
- 地表水
- 水