

Nitrogen & protein determination in beer and malt

KjelDigester K-449, KjelMaster K-375 with KjelSampler K-376:

Nitrogen and Protein Determination in Beer and Malt according to the Kjeldahl Method

1. Introduction

An easy and reliable method for the determination of total nitrogen and protein in beer and malt, according to AOAC 920.10/ 920.53/ 950.09, is introduced below.

2. Experiment

Sample:

Lager beer (protein content <0.5 g/100ml and 0.5 g/100ml)

Malt (protein content 12.5 g/100g and 9.5 g/100g)

Equipment:

KjelDigester K-449 (the parameters used are also valid for K-446), Scrubber K-415 TripleScrub^{ECO}, KjelMaster K-375 with KjelSampler K-376

Procedure:

The sample is homogenized and digested. After the digestion the sample is distilled and titrated.

Table 1. Distillation and titration parameters for the K-375 / K-376.

Parameters	Settings
Reaction time	5 s
Distillation time	180 s
Titration type	Boric acid
Sensor type	Potentiometric



3. Results

The results of the determined protein content in different beers are shown in Table 2.

Table 2. Results of the protein content in different beers (n=3).

Samples	Labelled protein content [g/100g]	Ø determined protein content	RSD [%]
Lager beer	<0.5	0.41	0.2
Lager beer	0.5	0.38	0.4
Malt	12.5	12.44	0.5
Malt	9.5	9.30	0.2

4. Conclusion

The determination of nitrogen and protein in beer and malt using the KjelDigester K-449 and KjelMaster system K-375/K-376 provides reliable and reproducible results. With the KjelDigester K-449 the digestion process (including preheating, digestion and cooling) is very fast and is fully automated. Together with the fully automatic KjelMaster system K-375/K-376, the time to result is significantly reduced and it offers fully walk-away convenience. For further information please download the full application note from the website.

5. References

- Application Note No. 108/2013: Nitrogen & protein determination in beer and malt
- Souci Fachmann Kraut: Die Zusammensetzung der Lebensmittel. Nährwert-Tabellen, CRS Press, 7., revidierte und ergänzte Auflage. 2008
- AOAC 920.49, Beer -Preparation of Sample
- Application Note 100/2013, Nitrogen Determination in Reference Substances –Operational Quality Check Procedure
- AOAC 920.53, Protein in Beer
- AOAC 950.09, Protein in Laboratory Malt
- Kjeldahl Calculator App
- Operation Manual of KjelDigester K-446/K-449
- Operation Manual of Scrubber K-415
- Operation Manual of KjelMaster system K-375/K376