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Determination of the LCV (Lead Conductance Value) of Hop Pellets by a simplified version of method EBC 7.5

Submitted on behalf of the Analysis Committee of the European Brewery Convention

BC 32 Hops

(Descriptors: Collaborative trial.

Deskriptoren: Ringanalyse).

1 Introduction

The EBC Analysis Committee decided to test a simplified version of method EBC 7.5 by a collaborative trial. The new method is allowing for direct conductometric titration of the ether phase instead of preparing a "stock solution". In winter 1999/2000 a collaborative trial was carried out using four samples of hop pellets with different alpha-acids levels in the range of 4 – 17%. 10 members of the EBC Analysis Committee and 5 members of AHA (Arbeitsgruppe Hopfenanalyse) took part in the collaborative trial.

2 Experimental

Four samples were circulated to 15 participants. Laboratories were asked to determine the LCV in duplicate to 2 decimal places. Results of 13 laboratories were evaluated. Two laboratories reported their equipment for conductometric titration of hop samples to be rarely used. Their results showed big systematic deviations as compared to all other results.

3 Results and discussion

Original data from the collaborative trial are given in table 1. No outliers were identified. The precision data are summarized in table 2. Values of r_{95} are in the range of 0,14 – 0,28 and values of R_{95} are in the range of 0,34 – 1,06. These statistical data are comparable to those obtainable with the original method EBC 7.5.

4 Conclusion

Based an the results of this collaborative trial the EBC Analysis Committee decided in its 92nd meeting to adopt the simplified version to replace the original method EBC 7.5. It will be published in the 2001-update of Analytica-EBC.

Table 1 Original data of the collaborative trial (all results as % LCV)

Lab	Hop Pellet 1	Hop Pellet 2	Hop Pellet 3	Hop Pellet 4
1	4.07/4.14	8.12/8.38	12.48/12.56	16.24/16.44
2	4.05/4.09	8.25/8.33	12.44/12.57	16.18/16.32
3	4.25/4.25	8.51/8.61	13.05/13.08	16.68/16.82
4	4.18/4.20	8.57/8.58	12.84/13.05	16.98/17.09
5	4.25/4.24	8.66/8.64	12.82/12.71	16.60/16.60
6	4.10/4.05	8.41/8.43	12.50/12.59	16.08/16.31
7	4.33/4.30	8.79/8.69	13.04/12.95	17.06/16.84
8	4.16/4.17	8.71/8.71	12.96/13.00	16.84/16.82
9	4.32/4.51	9.11/8.83	13.18/13.00	16.81/16.81
10	4.06/3.99	8.30/8.40	13.16/13.29	16.82/16.82
11	4.34/4.31	8.91/8.72	13.68/13.79	17.63/17.49
12	4.18/4.20	8.59/8.78	12.64/12.75	16.69/16.62
13	4.30/4.20	8.70/8.70	12.70/12.80	17.00/17.10

Table 2 Summary of the precision data (calculated from the data of table 1)

Sample	Hop Pellet 1	Hop Pellet 2	Hop Pellet 3	Hop Pellet 4
Number of laboratories	13	13	13	13
Grand mean	4.20%	8.59%	12.91%	16.76%
Repeatability standard deviation	0.049	0.099	0.084	0.094
Reproducibility standard deviation	0.119	0.225	0.346	0.375
Repeatability r_{95}	0.14	0.28	0.24	0.26
Reproducibility R_{95}	0.34	0.64	0.98	1.06