



VICINAL DIKETONES IN BEER

1. Principle

Using a water steam distillation the vicinal diketones biacetyl respectively 2,3-pentanedione are stripped out from the sample, collected, and then, determined photometrically. With o-phenylenediamin the formation of 2,3-dimethylquinoxaline builds up which has a specific absorption at 335 nm.

2. Area of Usage

Type of Sample	Amount of Sample	Content or Recovery
Beer	100 mg	

3. Method

Based on

MEBAK (Mittleuropäische brautechnische Analysenkommission), Brautechnische Analysenmethoden, Band II

4. Chemicals

- 4.1. Hydrochloric acid HCl c = 4 mol/l
- 4.2. O-phenylenediamine solution w = 1% in hydrochloric acid c = 4 mol/l (produced freshly every day and stored in the refrigerator)
- 4.3. Anti foam emulsion (free of diketones)

5. Instruments

- 5.1. VAPODEST 10 - 30 or VAPODEST 45 without titration cell, with upgrade kit for alcohol determination, cat. no. 7698
- 5.2. Kjeldahl flask with wide neck opening type KD 750, cat. no. 6467, or jumbo tube KDD 800, cat. no. 6461
- 5.3. Measuring flask 25 ml, 2 measuring flasks 50 ml
- 5.4. Photometer

6. Procedure

100 g of the non decarbonised beer is weighted into a Kjeldahl flask and 1 - 2 drops of the anti foam emulsion (4.3.) is added. Then the sample is run for 240 seconds in the water steam distillation. The steam output is set on 50 %. The distillate is received in a 25 ml measuring flask and prior to the photometrical determination it is filled up with distilled water to the tag and tempered.

Programming of VAPODEST:

Use the VAPODEST following the instruction manual. As a start run a blank distillation in order to heat up and clean the instrument. Check whether all chemicals are present in the required quantities!

The following program settings are recommended for the various models of the VAPODEST:

	VAP 10	VAP 20	VAP 30	VAP 45
H ₂ O Addition	-	-	0 s	0 s
NaOH Addition	0 ml	0 s	0 s	0 s
Reaction Time	0 s	0 s	0 s	0 s
Distillation Time	approx. 240 s	approx. 240 s	approx. 240 s	approx. 240 s
Steam Power	50 %	50 %	50 %	50 %
Suction Sample	<i>manual</i>	<i>manual</i>	25 s	25 s
H ₃ BO ₃ Addition	-	-	-	-
Suction Receiver	-	-	-	-
Titration	-	-	-	-
Calculation	-	-	-	-

The values given can only serve as a guideline for the analysis and have to be adapted to your requirements.

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7. Photometric Measuring

10 ml each of the mixed distillate are put into two 50 ml Erlenmeyer flasks (primary value, blank value).

0,5 ml o-phenylenediamin solution (4.2.) are added to the distillate for the primary value, mixed and let stand for 30 minutes in the dark.

2,5 ml hydrochloric acid (4.1.) are added to the distillate for the blank value and 2 ml hydrochloric acid (4.1.) to the distillate for the primary value.

Within 20 minutes the extinction of the main value towards the blank value is measured at 335 nm.