Vicinal diketone (Diacetyl and 2,3-Pentanedione) Measurement in Beer using an Eppendorf BioSpectrometer®

Introduction

Objective

Vincinal diketones (VDKs) include diacetyl and 2,3-pentanedione. VDK measurements are critical because VDK content can greatly alter the flavor of beer. VDKs are produced during the fermentation process and are considered unbeneﬁcial to the taste in the vast majority of brews. This is a quick method to measure VDK using a steam distillation device and the Eppendorf BioSpectrometer instead of time-consuming and expensive gas chromatography.

Principle

The VDKs in beer react with 1,2-phenylenediamine to form 2,3-dimethylquinoxaline which absorb at 335 nm.

Protocol

1. Weigh 100 g of flat beer into a distillation apparatus.
2. Add one drop of an antifoam emulsion.
3. The steam supply of the distiller should be set to obtain 25 mL of distillate in 2 minutes.
4. Place 10 mL distillate in each of two 50 mL tubes: one for the blank and one for the sample.
   - Blank: Add 2.5 mL 4 N hydrochloric acid.
   - Sample: Add 0.5 mL 1,2-phenylenediamine (diluted in 1% 4 N hydrochloric acid, freshly prepared), mix and incubate at room temperature in a dark place for 30 minutes. After the incubation, add 2 mL 4 N hydrochloric acid.
6. Select the soft key Edit to change the parameters.
   - Parameters
     - Cuvette: 10 mm
     - Wavelength: 335 nm
     - Unit: mg/mL
     - Factor: 2.373
     - Decimal Places: 2
7. Select the soft key Next.
8. Transfer 100 μL of the blank to a cuvette optically clear at 335 nm.
9. Insert the cuvette with blank so that the arrow is pointing towards you and the clear side is facing you.
10. Measure blank by pressing the round Blank key.
11. Insert the cuvette containing 100 μL of the sample in the same orientation as the blank cuvette.
12. Measure the sample by pressing the round Sample key.

VDKs are measured in mg/mL (mg of diacetyl and 2,3-pentanedione per mL of beer)

Reference

### Ordering Information

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