

Brewing Adjuncts Method

Scope

- Assess effect of added ingredients on mashing behavior of malt.

Rapid Visco Analyser

The Rapid Visco Analyser (RVA) is a cooking stirring viscometer with ramped temperature and variable shear profiles optimized for testing viscous properties. The instrument includes international standard methods as well as full flexibility for customer tailor-made profiles. Combining speed, precision, flexibility and automation, the RVA is a unique tool for product development, quality and process control and quality assurance.



Description

This application describes the use of an RVA to assess the effect of added ingredients on the mashing behavior of a malt. Malts are tested with and without added enzymes, adjuncts or chemicals (e.g. pH modifiers). The differences are used to determine the improvement or deterioration in mashing behavior of the malt due to the addition.

Where enzymes are added, the target test temperature is 69 °C, comparable to that used in commercial mashing. For tests of adjuncts, the target temperature is 90 °C to ensure gelatinization of the added starch.

An appreciation of the behavior of malt quality can be made from the peak height, peak area and particularly the final viscosity. A low final viscosity, particularly when achieved rapidly, will indicate that the combination should present few problems in the brewery. If a high final viscosity is observed, addition of further sources of diastatic power or other enzymes should be investigated.

Method

Compare difference between tests with and without added enzymes, chemicals (Profile1), or adjuncts (Profile2).

Sample Preparation

Tests without added material

9.00 g sample (14% mb) and 18.0 ml distilled water.

Tests with added Enzymes or Chemicals

9.00 g sample (14% mb), 1.0-5.0 ml enzyme suspension or chemical solution, and distilled water to make total liquid volume of 18.0 ml.

Tests with Adjuncts

Analytica-EBC Method: 5.40 g malt and 3.60 g adjunct (14% mb), 18.0 ml distilled water.

Institute of Brewing Method: 4.50 g malt and 4.50 g adjunct (14% mb), 18.0 ml distilled water.

Profile

1. Effect of enzymes, chemicals

Time	Type	Value
00:00:00	Temp	50°C
00:00:00	Speed	960 rpm
00:00:10	Speed	160 rpm
00:01:00	Temp	50°C
00:04:42	Temp	69°C
00:09:12	Temp	69°C
00:14:12	Temp	50°C
00:15:00	End	
Idle Temperature: 50 ± 1°C Time Between Readings: 4 s		

2. Effect of starch-containing adjuncts

Time	Type	Value
00:00:00	Temp	50°C
00:00:00	Speed	960 rpm
00:00:10	Speed	160 rpm
00:01:00	Temp	50°C
00:04:42	Temp	90°C
00:09:12	Temp	90°C
00:14:12	Temp	50°C
00:15:00	End	
Idle Temperature: 50 ± 1°C Time Between Readings: 4 s		

Measure

FV: Final viscosity (cP)

PA: Peak area (cP.min)

PV: Peak viscosity (cP)

TV: Trough viscosity (cP)

The FV is the RVA Adjunct Index. Low values of this index usually indicate that the tested conditions would be satisfactory in the brewery. Indicate which profile was used.

Considerable additional information can be gained by analyzing the sample post-viscography for soluble components. At the conclusion of a test, each slurry can be diluted to a standard grist to liquid ratio, then clarified by filtration or centrifugation. Measurement of total soluble solids, soluble protein, β -glucan or other components of interest can be carried out on the "extract".