Corn Starch Method

Scope

- Assess the cooked viscosity of starch.
- Quality control.
- Monitor consistency of starch quality between batches.
- Compare pasting behavior of different starches.

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

In the USA and Canada, 95% of starch is derived from maize, and it also dominates in Europe. The diversity of corn starches available, including normal, waxy and high amylose types, has made this starch suitable for a wide range of applications.

The Brabender ViscoAmyloGraph has traditionally been used to estimate the performance characteristics of maize starches. However, the long slow heating and cooling protocol may not simulate actual production procedures and restricts the number of samples that can be analyzed to four or five a day.

This method is applicable to unmodified corn and other cereal starches. A 13-minute test in the RVA provides a rapid yet accurate alternative to study the cooking properties of unmodified cereal starches, making it suitable for both research and quality control applications.
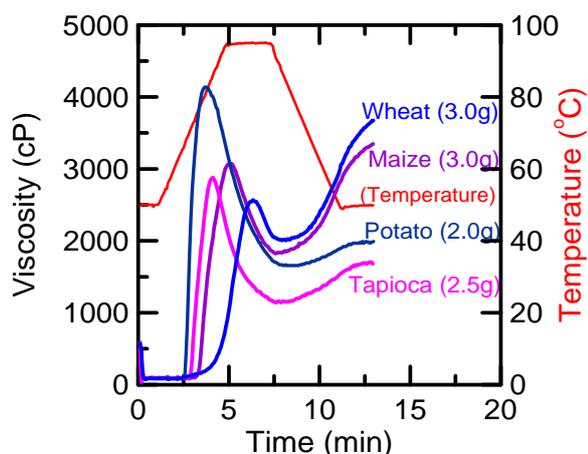

Fig. 1. RVA Pasting curves of various native starches using the 13-minute STD1 profile.

Method
Thirteen–minute pasting profile.

Sample Preparation
3.00 g regular cereal starch (2.50 g waxy; 2.00 g commercial potato starch) at 14% moisture and 25.0 ml distilled water.

Profile

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	95°C
00:07:12	Temp	95°C
00:11:00	Temp	50°C
00:13:00	End	
Idle Temperature: 50 ± 1°C Time Between Readings: 4 s		

Measure

PT: Pasting temperature (°C)
PV: Peak viscosity (cP)
PTi: Time to peak (min)
BD: Breakdown (cP)

TV: Trough/minimum viscosity (cP)
SB: Setback (cP)
FV: Final viscosity (cP)

The PV is the RVA Corn Starch Index. The thickening behavior of the starch will be indicated by its peak and final viscosities. Its susceptibility to shear and heat is evident from the breakdown. Setback and final viscosity often provide an indication of final texture, with higher levels of amylose often giving a large setback and the likelihood of syneresis.