



APPLICATION NOTE No°: 2507001

Polarimetric Dextran Determination - DRAFT -

Dextran Determination using NIR Polarimeter

Introduction:

The method uses a polarimeter with NIR (near infrared wavelength) and a specific dextranase, which selectively breaks-down the dextran into sugars of lesser specific rotation without affecting other substances present in the juice.

The initial dextran concentrations is derived from a calibration curve of the change in the measured optical rotation (OR) due to enzymatic hydrolysis, calculated and displayed automatically by the Polarimeter. The procedure takes approx. 10 minutes and depending on the customer's needs and expectations, it can be semi-automated. The use of a NIR Polarimeter makes the use of sample clarification unnecessary, the sample just has to be filtrated using filter paper and filter aid.

The devices, instruments and material needed for this method are:

Device	Remark	Model (e.g.)
Filtration unit (optional)	Pressurized version is recommended. This allows a faster sample filtration, reduces sample preparation time to less than a minute, ensuring minimal sample evaporation and no dextran removal	
Laboratory pipette	for adding the enzyme (dextranase) solution	
Laboratory shaker/rotator	suitable for sample vials from 20 ml to 100 ml, improves the repeatability, reproducibility and accuracy of results	
Peristaltic pump	for pumping the sample solution to the flow-through tube of the polarimeter for filling and emptying the polarimeter tube, if the user wants to ease the sample handling	
Thermocirculator	for best results, high precision temperature control at 20 °C is recommended	

Instruments	Remark	Model (e.g.)
Polarimeter , dual wavelength (visual and NIR) with jacketed flow-through tube, 200mm with temperature sensor	With optional program Dextran Calculation. It displays pol, Brix, dextran concentration, corrected pol, purity (optionally, if refractometer is connected). Results can be displayed in 1 display, further displays can be programmed additionally and individually customized	S+H's Polartronic M 202 (589 + 882 nm) or Saccharomat 202 (587 + 882 nm)
Refractometer measuring unit with flow-through cell (optional)	For standard purity measurements, if desired. Also allows results to be displayed as dextran on Brix	PURE 01/02 measuring unit



Consumables	Remark	Manufacturer type (e.g.)
Filter paper		
Filter aid		
Sample vials	100 ml capacity, with cap	
Pipette tips		
Dextranase	Pure dextranase, activity 30,400 units/ml is diluted 1:5 with distilled water	Sigma

Performing the Dextran Determination

After filtering, the sample is poured into a test vial and the dextranase solution is given using the pipette. The test vial is closed with a cap, placed onto the laboratory shaker/rotator and its timer set to 7 minutes.

The control sample is pumped into the polarimeter flow-through tube.

If a purity measurement is required, a small sample amount is also placed in the refractometer.

For easing the sample handling, the flow-through cell of the refractometer can be connected in series with the polarimeter flow-through tube. By this means, the sample is pumped into the refractometer cell and polarimeter tube subsequently.

The polarimeter measures continuously, after stabilization it will show the measuring value and input the Brix value (if this applies). Then it will ask for the test solution.

When the 7 minute mixing cycle is complete, the sample is pumped into the polarimeter flow-through tube. After stabilization, the polarimeter automatically calculates and displays the results pol, Brix, dextran concentration and provides a corrected polarimeter value, optionally purity (if the refractometer is connected).

