Application Note:
AN-LECF-TOMATOMU-0908

Efficient Separation of Tomato Soluble Solids Using the Thermo Scientific Sorvall Discovery M150 SE Microultracentrifuge and S140-AT Rotor

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KEY WORDS

- Tomato Soluble Solids
- S140-AT Rotor
- Microultracentrifuge

Introduction

The USDA recommends that the percent of natural tomato soluble solids (%NTSS) be used to group tomato paste into concentration categories. This product specification is used throughout the industry for standardization of marketing and sales.

In this procedure, a micro-ultracentrifuge is used to separate the serum from insoluble solids and an electronic refractometer is used to measure the refractive index of the clarified serum and determine the %NTSS.

The Thermo Scientific Sorvall Discovery M150 SE microultra-centrifuge with the S140-AT fixed-angle rotor allows the user to efficiently process 10 samples at over 1,000,000 x g. Since the tubes used for this procedure do not require a tube cap, processing can be streamlined.

The Sorvall® Discovery™ M150 SE microultracentrifuge provides excellent results and a time saving of over 10 minutes per run compared to a competitive microultracentrifuge. This brief describes the procedure used to determine the percent of natural tomato soluble solids in tomato paste.

Procedure

1. Scrape and discard 0.5 inch of paste from the surface of the container from which the sample will be collected.
2. Place 10 thickwalled polycarbonate centrifuge tubes (Cat. No. 45237) into a tube holder.
3. Fill each tube 3/4 full with a representative sample of paste without adding air bubbles.
4. Place the tubes in the S140-AT rotor (Cat. No. 45978), secure the rotor lid, and place the rotor on the centrifuge drive spindle.
5. Centrifuge the samples at 140,000 rpm (1,048,600 x g) for 10 minutes at 20 °C using acceleration rate 9 and deceleration rate 9.
6. After the run has terminated, remove the tubes from the rotor and hold the tubes at a 5-20° angle from horizontal with the pellet side up.
7. Pull the serum from the bottom portion of the tube without disturbing the pellet.
8. Mix the serum for 1 to 1.5 minutes in a circular motion at the mouth of the tube, with the spatula, until the serum is visually uniform.

Thermo Scientific Sorvall Discovery M150 SE Microultracentrifuge

9. Pull serum which flows inward back towards the mouth of the tube to establish a uniform mixture.
10. Measure the refractive index in a calibrated electronic refractometer using standard reference solutions to bracket the expected sample reading.
11. Calculate the %NTSS and record.

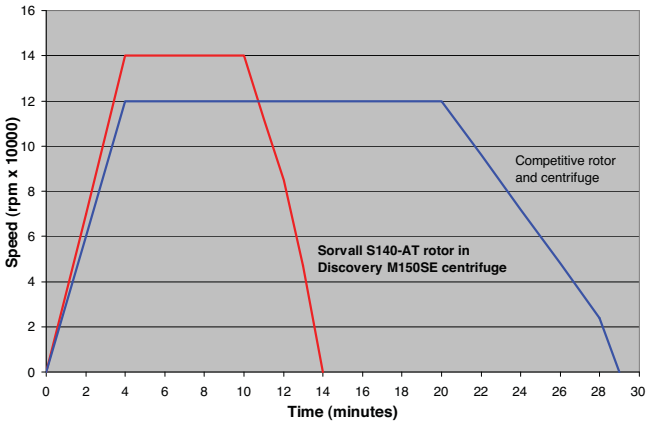

Figure 1. The Thermo Scientific Sorvall Discovery M150 SE microultracentrifuge with the S140-AT rotor can generate RCFs in excess of 1,000,000 x g.

Conclusion

The Sorvall Discovery M150 SE microultracentrifuge and S140-AT rotor can generate RCFs in excess of 1,000,000 x g (Figure 1). The rapid acceleration ensures that samples experience optimal RCFs within the shortest amount of time. This centrifuge and rotor combination offer a time savings of over 10 minutes per run compared to a competitive microultracentrifuge. The Sorvall Discovery M150 SE microultracentrifuge and S140-AT rotor provide an efficient and reproducible mechanism for separating tomato soluble solids from tomato paste.

References

1. Palombi, J. and Matthews, S. Efficient Separation of Tomato Soluble Solids Using the Sorvall Discovery M150 SE Microultracentrifuge and S140-AT Rotor. Application Brief, S00430.

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