

# Efficient Separation of Tomato Soluble Solids Using the Thermo Scientific Sorvall MTX Micro-Ultracentrifuge and S140-AT Rotor

## KEY WORDS

- Natural Tomato Soluble Solids
- Tomato Paste
- S140-AT Rotor
- Sorvall MTX Micro-Ultracentrifuge
- Sorvall MX Micro-Ultracentrifuge

## 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 to determine the %NTSS.

The Thermo Scientific Sorvall MTX Micro-Ultracentrifuge with the Thermo Scientific S140-AT fixed angle rotor allows the user to efficiently process 10 samples at over 1,000,000 x g. The 1.0 mL polycarbonate (PC) thick-walled tubes used in this method do not require tube caps, making processing streamlined.

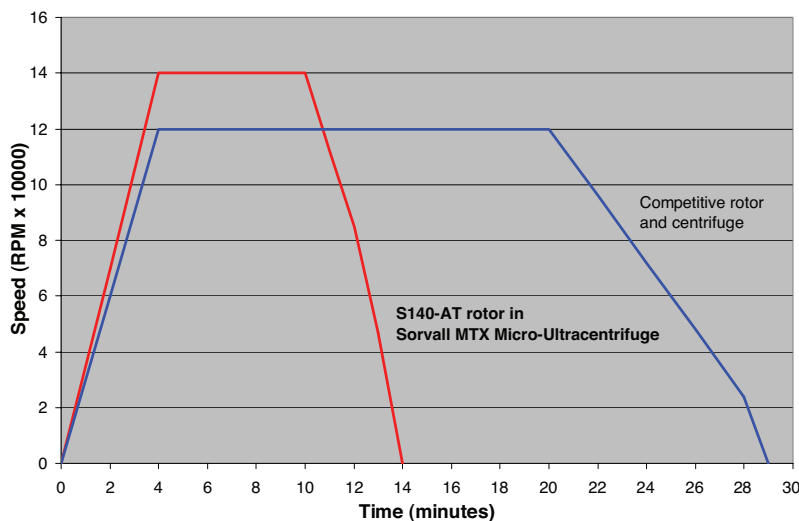
The Sorvall® MTX Micro-Ultracentrifuge provides excellent results and a time saving of over 10 minutes per run compared to other micro-ultracentrifuges (based on a comparison with manufacturers' published specifications) (Figure 1). This brief describes the procedure used to determine the percent of natural tomato soluble solids in tomato paste.

## Procedures

1. Scrape and discard 0.5 inch of paste from the surface of the container from which the sample will be collected.
2. Fill 1.0 mL polycarbonate (PC) thick-walled tubes (PN 45237) 3/4 full with a representative sample of paste. Avoid adding air bubbles.
3. Perform centrifugation using the S140-AT fixed angle rotor with the following parameters: 140,000 RPM (1,048,600 x g) for 10 minutes at 20 °C, Acc.9, Dec. 9.
4. After the run has terminated, carefully remove the tubes from the rotor. Hold each tube at a 5-20° angle horizontally with the pellet side up.
5. Using a syringe or pipette tip, carefully pull the serum from the bottom of the tube without disturbing the pellet and place the serum into fresh tubes.
6. With a thin spatula, mix the serum for 1 to 2 minutes using a circular motion at the mouth of the tube until the serum is visually uniform.
7. Using a syringe or pipette, pull the serum from the bottom center of the tube to the top of the tube to establish a uniform mixture. Avoid adding bubbles.
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.



Thermo Scientific Sorvall MTX Micro-Ultracentrifuge and S140-AT Rotor



Based on a comparison with manufacturers' published specifications.

**Figure 1.** The Thermo Scientific Sorvall MTX Micro-Ultracentrifuge with the S140-AT rotor can generate RCFs in excess of 1,000,000 x g.

## Conclusion

The Sorvall MTX Micro-Ultracentrifuge 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 micro-ultracentrifuge. The Sorvall MTX Micro-Ultracentrifuge 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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