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Chocolate Viscosity Analysis

Understanding the viscosity of chocolate is crucial for optimizing its use in various applications, such as candies, icings, and pastry filling. Viscosity affects the flow, texture, mouthfeel, and coating properties of chocolate, which are important for both manufacturing efficiency and customer satisfaction.

Test Equipment:

- Instrument: Viscometer or Rheometer (e.g., Brookfield DVNXHA)
- Torque Range: HA
- Spindle: SC4-27 with SC4-13RPY chamber

Accessories:

- Small Sample Adapter
- TC-550SD Programmable Temperature Bath
- Speed Settings: 5, 10, 20, 50, and 100 RPM
- Temperature: 40°C

Test Method:

- Small Sample Adapter used with a Brookfield Viscometer/Rheometer and RheocalcT software for automated control and data acquisition.
- Temperature Control: 40°C, maintained via water jacket connection to the TC-550SD Programmable Refrigerated Bath.

Data Observations:

- Figure 1: Viscosity of dark chocolate decreases as shear rate increases, showing "shear-thinning" behavior.
- Figure 2: NCA/CMA Casson model fits the raw data with a nearly 100% Confidence of Fit (CoF).
- Plastic viscosity: 1241 cP
- Yield stress: 129 dyn/cm²

Chocolate at 40°C: DVNXHA, SSA27/13RPY

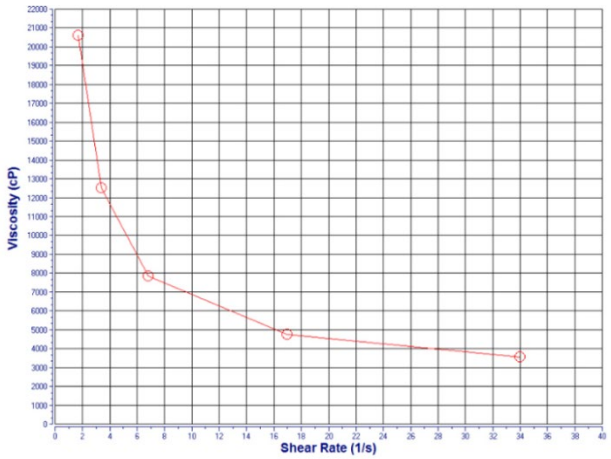

Figure 1: Dark Chocolate Viscosity at 40°C

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Additional Notes:

- Chocolates may be tested at various shear rates (1, 2.5, 5, 10, 20, 50 RPM) to ensure accurate data.

Degrees MacMichael Calculation:

- Torque reading at 20 RPM is used to calculate Degrees MacMichael.
- Example: Torque of 31.4% at 20 RPM corresponds to 106.8 Degrees MacMichael.

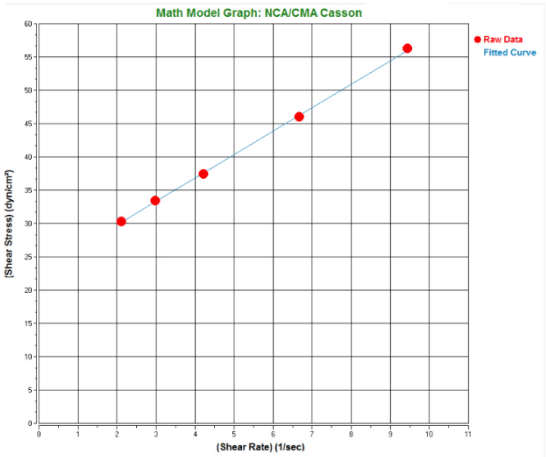

Figure 2: NCA/CMA Casson Plot of Chocolate Rheology at 40°C

Figures:

- Figure 1: Dark Chocolate Viscosity at 40°C, demonstrating shear-thinning.
- Figure 2: NCA/CMA Casson Plot of Chocolate Rheology at 40°C, showing a good fit to the model.