

## USE

Chocolate syrup is mixed with milk to make chocolate milk and is used as a topping on various desserts.

## TEST EQUIPMENT

- **Instrument:** Viscometer or Rheometer
- **Spring Torque Range:** RV
- **Spindle:** SC4-18 / 13RP Sample Chamber
- **Accessories:** Small Sample Adapter, TC-502P Programmable, Refrigerated Bath
- **Speed, rpm:** 3, 6 and 9 rpm at 4°C;  
10, 20, 30 and 40 rpm at 25°C

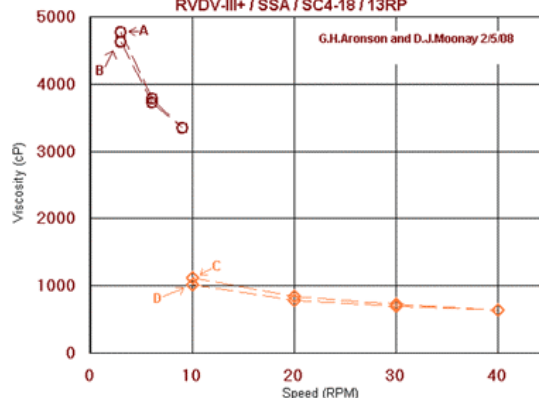


## TEST METHOD

The Small Sample Adapter™ may be used with various Brookfield Viscometers or Rheometers. In our example, we used a Brookfield RVDV-III Ultra, with Rheocalc™ v3.1 software for automated instrument control and data acquisition. Our test temperatures of 4°C and 25°C were maintained by connecting the Small Sample Adapter™ water jacket to a TC-502P Programmable Refrigerated Bath. Representative data from the analyses are shown in Figure 1.

The Figure 1 graph shows, at both test temperatures, viscosity decreasing as speed is increased. This type of flow behavior is sometimes referred to as "shear-thinning". This material was tested by ramping up and then down in speed. The difference in viscosity, at 4°C, between starting point "A" and endpoint "B" and, at 25°C, between starting point "C" and endpoint "D", results from slight thixotropy. That is, structure in the fluid breaks down over time, during shearing. This structure takes time to rebuild - so the viscosity at "B" is lower than at "A" and, likewise, the viscosity at "D" is lower than at "C". The graph also shows that the chocolate syrup viscosity is higher at the lower temperature, 4°C (Dark Brown Data), than at 25°C (Light Brown Data). Increasing temperature often decreases the viscosity of a given substance. Testing with an RVDV-III+, the SC4-18 spindle produced on-scale results at both test temperatures. However, when testing at 4°C, we had to use speeds slower than those used at 25°C, in order to obtain on-scale results.

Chocolate Syrup at 4°C (Dark Brown Data) and 25°C (Light Brown Data)  
RVDV-III+ / SSA / SC4-18 / 13RP



**Figure 1**  
Chocolate Syrup at 4°C and 25°C.

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