

SOLUBLE POLYSTYRENE SULFONATE (Quinine Haze Test)

PRINCIPLE

A diluted sample is treated with quinine hydrochloride which reacts with soluble polystyrene sulfonate (SPS) to produce turbidity; this is measured spectrophotometrically at 720 nm. Results are expressed as transmittance (% T).

SCOPE

This method is intended for application to fructose-containing corn syrups.

SPECIAL APPARATUS

1. Graduated Cylinder: Mixing cylinder with a glass stopper, 100 mL capacity
2. Vortex Mixer: Vortex GENIE7 or equivalent
3. Spectrophotometer: Visible-range instrument, equipped with matching 1 cm cells

REAGENTS

Quinine Hydrochloride Solution, 6%: Dissolve 6 g of reagent grade quinine monohydrochloride dihydrate ($C_{20}H_{24}N_2O_2 \cdot HCl \cdot 2H_2O$) in about 75 mL of warm purified water in a 100 mL flask. If necessary, place the flask in a warm water bath until the solution is clear. Cool to room temperature and dilute to 100 mL volume. Protect the solution from light. Prepare solution fresh weekly. If the solution starts to crystallize, warm to redissolve the crystals before using.

PROCEDURE

Place 50 mL of sample (containing 70-80% dry substance) into a 100 mL graduated cylinder. Dilute to 100 mL with purified water, mix and pressure filter 30-40 mL through a 1 μ m filter pad. Pipet 10 mL of solution into a test tube (18 \times 150 mm), add 2 mL of quinine hydrochloride solution and mix. Let stand for 30 mins.

SOLUBLE POLYSTYRENE SULFONATE (Quinine Haze Test) — continued

Place the test tube in a boiling water bath for exactly 5 mins. (Note 1). Cool immediately and determine transmittance through a 1 cm cell in the spectrophotometer at 720 nm, against a sample blank composed of 10 mL of filtered sample solution plus 2 mL of purified water.

CALCULATION

Report quinine haze test results as transmittance (% T).

NOTES AND PRECAUTIONS

1. The reaction between polystyrene sulfonate and quinine is not instantaneous. Turbidity approaches a maximum level after about 30 mins. and heating 5 mins.

METHOD HISTORY

Corn Syrup, Soluble Polystyrene Sulfonate (Quinine Haze Test) (E-56), Date of Acceptance 11-28-1984, Revised 10-07-1996.