

the carbazole solution, using a Fisher electrophotometer with a 525 $m\mu$ filter and a 3 ml. micro cylindrical absorption cell.

Sugars, citric acid and ascorbic acid will react with carbazole to form colored products of varying degrees of intensity. At a wave length of 525 $m\mu$ (Beckman spectrophotometer, model B) the maximum interference was caused by fructose (5).

The two alcoholic extractions with ethyl alcohol were sufficient to reduce the concentration of these soluble juice constituents (18) to a level of negligible interference. The pectic substances were also precipitated from colloidal solution by the dehydrating action of the ethyl alcohol. Ethyl alcohol left in the precipitate following the second alcoholic extraction acts as a wetting agent and aids in dispersing the pectic substances in the following water extraction.

TECHNIQUES

Attention should be called to the following techniques that result in more consistent data when used in the analytical procedure for determining pectic substances in citrus products.

Centrifugation of the water and oxalate extractions of pectin from the alcohol precipitate of citrus concentrate facilitates complete sedimentation. When the water and oxalate extractions of pectin are separated by centrifugation from the alcohol precipitate of fresh citrus juice, inevitably some insoluble solids remain floating. On decantation it is impossible to prevent this floating material from passing into the volumetric flask. To prevent the occurrence of floating material about $\frac{1}{2}$ teaspoonful of disintegrated, wetted paper pulp (Whatman Ashless Tablets) is added to the 50 ml. centrifuge tube during the first water extraction. The paper pulp aids the sedimentation during centrifugation by carrying the insoluble solids to the bottom of the centrifuge tube.

A technique that should be carefully followed in the colorimetric procedure is regulation of the time required to add the 6 ml. of concentrated sulfuric acid. The analyst should have a dispenser set to deliver 6 ml. sulfuric acid in seven sec. to obtain a temperature of 85°C. (heat of solution) and should immediately place the large test tube in a water bath heated to 85°C. Otherwise, varying intensities of red color may be produced in duplicate samples. The tube should remain in the bath for five min. and during this waiting period the temperature need not be maintained.