The Determination of Sodium and Potassium in Fruit Juice

Introduction
This method involves the dilution of the fruit juice sample with water followed by filtration and finally aspiration directly into a JENWAY flame photometer.

Materials Required

Equipment
JENWAY Flame Photometer
Filtration apparatus
Volumetric glassware

Reagents
1000ppm sodium standard solution (Jenway Part Number 025 021)
1000ppm potassium standard solution (Jenway Part Number 025 023)
Deionised water

Method

1. Prepare 20, 15, 10 and 5ppm sodium and potassium standards by dilution of the Jenway standard solutions using deionised water. Deionised water is used as the blank solution.

2. To 10ml of the fruit juice, add 50ml of deionised water.

3. Filter the fruit juice solution through an ashless filter paper (e.g. Whatman 540) into a litre volumetric flask. Ensure that the solid particles retained by the paper are washed thoroughly, collecting the washings into the same 1 litre flask. Dilute to the mark with deionised water and mix by inversion.

4. Set up the flame photometer for sodium as outlined in the instruction manual.

5. Set blank to zero with deionised water.

6. Aspirate the standards and record their stable readings.

7. Plot a graph of the reading against standard concentration.

8. Aspirate the sample solution. Record the reading and from the graph read off its sodium concentration.

9. Adjust the filter position to select the potassium filter and repeat steps 4 to 8 for potassium.

10. If the sodium and potassium concentrations in the fruit juice are outside the range of standards, the sample should be diluted accordingly.

Calculation
Multiply the concentration of sodium and potassium obtained from the graphs by the dilution factor, i.e. x100, to express the result in ppm or mg/l of sodium or potassium in the original fruit juice.