DETERMINATION OF SODIUM IN FOOD

The measurement of sodium in food is important due to the link between high blood pressure (hypertension) and sodium concentration. The sodium level is found by the technique of known addition.

Equipment Required

1. Ion Meter/ pH meter with millivolt display
2. Sodium ion selective electrode (Glass or PVC)
3. Double junction reference electrode *(only required if a mono Sodium is being used)*

Reagents

1. Sodium stock solution 2000 ppm
2. Prepare 100 ppm, 1000 ppm and 2000 ppm sodium standard solutions by serial dilution of the stock solution.
3. Sentek Sodium ISAB

Sample Preparation

Blend contents of sample including any water. Weigh a 10 g sample and dilute to 100 ml with DI ionised water. Mix and transfer to a clean, dry 150 ml beaker. Add 2ml of ISAB per 50ml of sample or standards. Stir all samples and standards during the measuring process.

Method

Take 100 ml of sample, immerse electrode and record the electrode potential mV. Pipette 5 ml of standard (see below table), stir thoroughly, allow for stabilisation and record the electrode potential mV.

Table

For Samples between	**Per 100g of sample use**
0-5mg Na^+	100ppm Standard
5-50mg Na^+	1000ppm Standard
50-100mg Na^+	2000ppm Standard

Calculation

$$C_U = C_S \left[\frac{V_s}{V_s + V_U}\right]\left[10^{\frac{\Delta E}{S}} - \frac{V_U}{V_S + V_U}\right]^{-1}$$

Where:

C_u= Concentration of unknown ion

Cs= Concentration of Standard addition

Vs = Volume of Standard addition

V_U= Volume of sample

ΔE = Change in electrode potential in mV

S = Slope of electrode in mV

The difference in the measurements mV_2-mV_1=ΔE. An accurate value of the electrode slope will be required, this can be found by producing a calibration curve using the 100 and 1000 ppm standards. To determine the mg per cent (mg/100 g of food), multiply the answer obtained from the equation for known addition by 10.