Thermo. Titr. Application Note No. H-058

Title:	**Determination of Sodium as Chloride in Ketchup and Sauces**

***Scope*:**	Determination of sodium as chloride in ketchups, sauces and similar food products.

***Principle*:**	Titration with standard $AgNO_3$ solution to a single exothermic endpoint. Sodium content is determined assuming it is all present as NaCl.

Reagents:	*Titrant:* 0.1 mol/L $AgNO_3$ solution. *pH modifier:* 5 mol/L HNO_3 solution

Method:	*Basic Experimental Parameters:*	
	Titrant delivery rate (mL/min.)	2
	No. of exothermic endpoints	1
	Data smoothing factor (DSF)	50
	Stirring speed (802 stirrer)	7
	Stir time before titration starts (sec.)	25
	Sample preparation:	
	Depending on estimated sodium content of the sample, weigh 0.5 – 2g of sample into a clean, dry titration vessel. Add 30mL D.I. water and 1mL 5 mol/L HNO_3. Adjust sample mass to obtain a titre of ~3 – 5mL 0.1 mol/L $AgNO_3$.	
	Note: Since food labelling regulations demand the result be expressed in *mg Na/100mL* (rather than *mg Na/100g*), it is necessary to separately determine the density of the product.	

Examples:

	Brand	*Claimed total Na mg/100mL (on label)*	*Chloride content, expressed as Na g/100mL*
	Master Foods tomato sauce	1141	833±2.1 (n=5)
	Master Foods tomato sauce, reduced salt	598	536±1.2 (n=5)
	Fountain tomato sauce	835	689±1.3 (n=5)
	Fountain barbecue sauce	550	435±1.3 (n=5)
	Rosella tomato sauce	1250	997±0.3 (n=7)
	Coles tomato sauce	910	811±0.4 (n=7)

Calculations:

$$\text{Na g/100g} = \frac{((\text{Titre, mL} - \text{blank, mL}) \times \text{AgNO}_3 \text{ mol/L} \times 22.98977 \times 100}{\text{sample mass, g}}$$

$$\text{Na g/100mL} = \frac{\text{Na g/100g}}{\text{density}}$$

Typical Thermometric Titration Plot: sodium (as chloride) in tomato sauce

Legend:
Red = solution temperature curve
Black =second derivative curve (for endpoints)