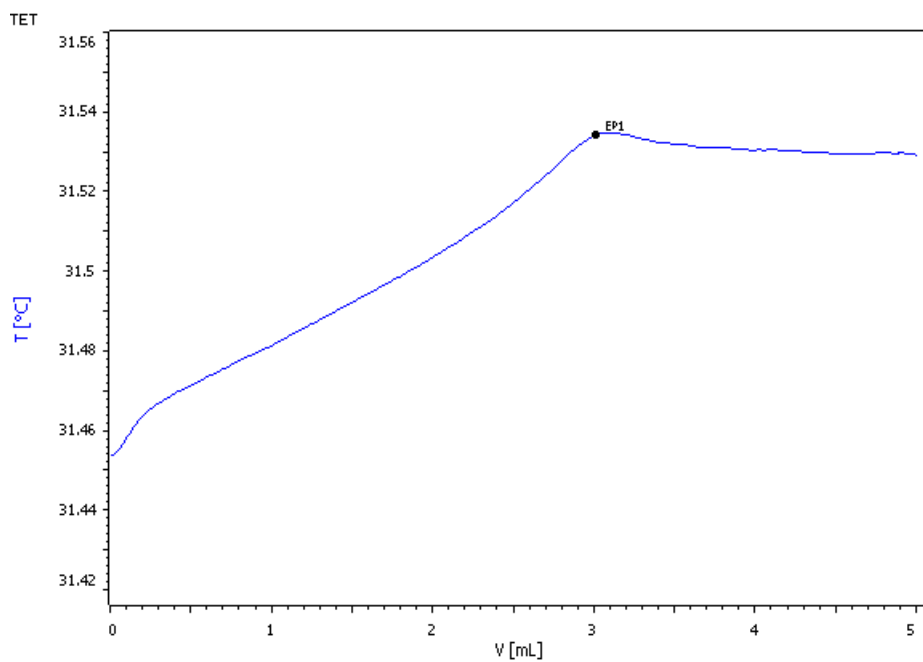# Automated determination of sodium in cheese

Sodium in cheese can be determined thermometrically without further sample preparation and without adding additives. It is shown that a homogenizer takes over dispersion and stirring.

Metrohm

Method description

Sample

Parmesan (hard cheese)

Luzerner Rahmkäse (semi-hard cheese)

Sample preparation

No sample preparation is required

Configuration

814 USB Sample Processor	2.814.0010
859 Titrotherm	2.859.0010
772 Pump Unit	2.772.0120
Polytron PT 1300 D	2.136.0100
800 Dosino (4 ×)	2.800.0010
786 Swing head	2.786.0040
Dispersing unit for Polytron	6.9012.010
Titration head	6.1458.040
Robotic arm with holder for titration head, right swinging	6.1462.070
3-way stopper with antidiffusion valve	6.1543.210
FEP – Tubing / M6 / 100 cm	6.1805.210
Sample rack 59 × 120 mL	6.2041.840
120 mL PP beaker (250 ×)	6.1459.300
Drip pan for 730 / 778 / 814 / 838	6.2711.060
Dosing unit 5 mL	6.3032.150
Dosing unit 10 mL	6.3032.210
Dosing unit 50 mL	6.3032.250
Dosing unit ETFE	3.8073.110
HF Resistant Thermoprobe	6.9011.040

Solutions

Mixed titrant: $c(Al_3^+) = 0.5$ mol/L, $c(K^+) = 1.1$ mol/L	187.6 g $Al(NO_3)_3$ and 111.2 g KNO_3 are given into a 1 L volumetric flask and dissolved in approx. 800 mL deion. water. After reaching room temperature, the solution is filled up to the mark with deion. water.
Auxiliary solution: $\beta(NH_4F) = 400$ g/L	200 g NH_4F is given into a 500 mL volumetric flask and dissolved in approx. 300 mL deion. water. Afterwards, the solution is filled up to the mark with deion. water.

Analysis

Blank Determination

A linear regression of different sample sizes against consumption is performed. For this purpose, an amount of 2–6 g cheese is weighed into a 120 mL PP beaker with subsequent addition of 40 mL deion. water. The cheese is dispersed for 120 s at 30.000 rpm. Then, 5 mL toluene and 5 mL auxiliary solution are added. After a pause of 60 s, the solution is titrated to after the endpoint.

Sample Determination

The sample analysis is performed in the same way as the blank determination but omitting the linear regression.

Parameters

Blank / Sample determination

Mode	TET
Start volume	0 mL
Pause	60 s
Dosing rate	4 mL/min
Filter factor	20
Damping until	0.5 mL
Stop volume	5
Evaluation start	0.5 mL
Reaction type	exothermic
EP criterion	-10

Results

Sodium contents (n = 3)

Sample	Na / (g/100g)	S(rel) / %
Parmesan	0.819	1.0
Luzerner Rahmkäse	0.769	1.2

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