

ANALYSIS OF SODIUM IN OIL

Sodium can be measured in a homogeneous, low zincous oil sample with a theoretical limit of detection (3σ , 100 s) of 8 ppm.

Measuring parameters for SRS 3000, SRS 3400 and SRS 303 sequential X-ray spectrometers

- X-ray tube with rhodium anode, 75 μm ultra thin window, operated at 30 kV and 100 mA
- helium operation
- sample cup mask: 42 mm diameter
- collimator mask: appropriate to the sample cup mask
- 0,46° collimator
- analyzer crystal: OVO-55
- detector: flow counter with small discriminator window setting
- measuring time: 100 s for the line and 2 x 100 s for the background

Sample preparation

- liquid cup with 43 mm inner diameter and 51 mm outer diameter
- 4 mm thick Prolene foil
- non-free-flowing samples: the sample is warmed up to 40 °C; filled into a liquid cup, standing on a plain surface, until the oil is cooled down

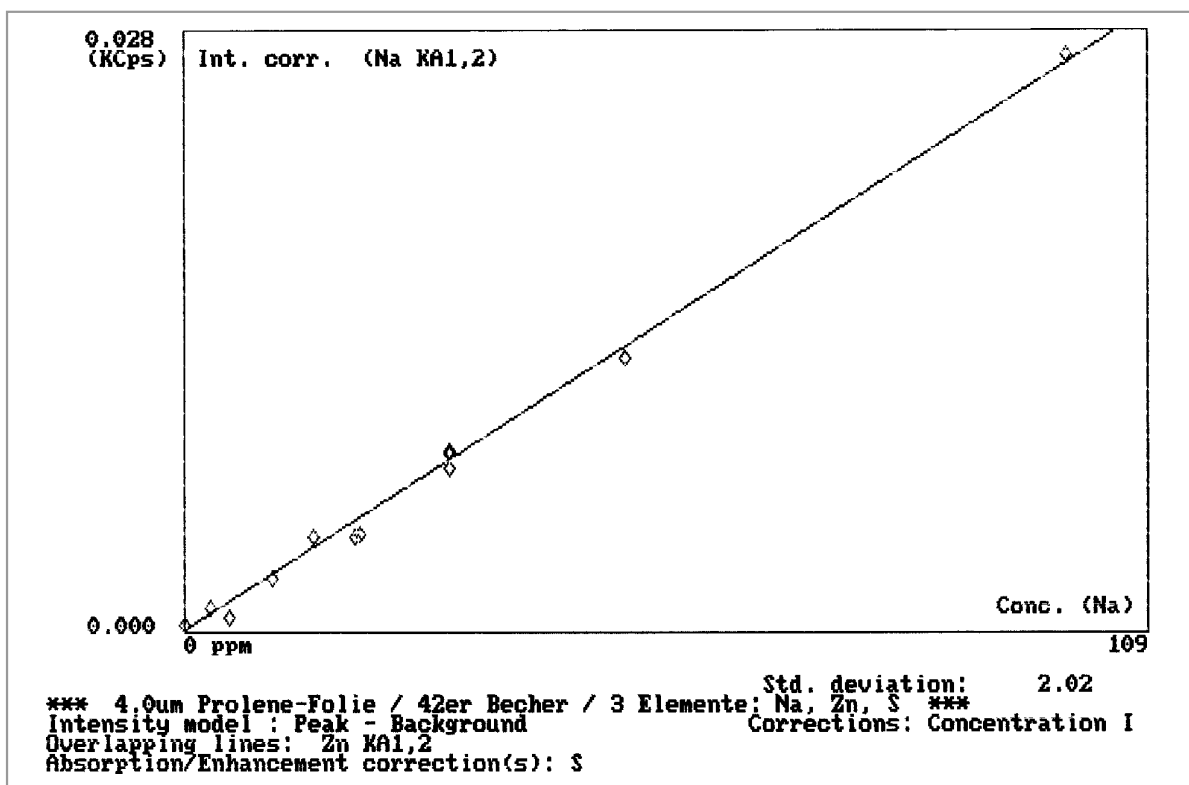
Measuring program

Zn $K\alpha_{1,2}$ must be measured in addition to Na, since Zn $L\beta$ overlaps the Na $K\alpha_{1,2}$ line. The measuring program should only contain one additional element, e.g. sulphur, since the Prolene foil is not very stable.

Calibration

The calibration example is shown on the next page.





Compound: Na

Std. deviation: 2.02

Net intensity model : Peak - Background

Dead time correction: ON

Line overlap corrections Factor
Zn 1.68879E-04

Concentration correction model: Concentration I Regression weighting: Absolute

Intensity at 100 % : 267.133 KCps - Slope : 3743.5 ppm / KCps

Intensity at 0.0 % : +0.000 KCps - Offset:+0.00000E-01 ppm (

Absorption / Secondary emission correction
S 0.45117 (fixed)

Standard	Status	Measured KCps	Chemical ppm	Computed ppm	Deviation ppm	Rel.
1 3-00		0.0003	0	1	1	
2 3-S21_03		0.0012	3	4	1	28.33
3 3-S21_05		0.0009	5	2	-3	-54.24
4 3-S21_10		0.0028	10	9	-1	-11.29
5 3-S21_20		0.0053	20	17	-3	-15.71
6 3-S21_30		0.0095	30	31	1	4.82
7 3-S21A30		0.0094	30	31	1	3.55
8 3-S12-15		0.0045	15	17	2	13.32
9 3-S12-20		0.0045	19	16	-3	-15.33
10 3-S12-30		0.0077	30	29	-1	-4.91
11 3-S21-50		0.0143	50	48	-2	-4.40
12 3-S21100		0.0300	100	101	1	1.48

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