

Calibration of Element-analyzers – (LECO CN 2000, CNS 2000 and SC 432)

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BFW - Forest Foliar Co-ordinating Centre

Specifications of the instruments

Model	Sample weight	Type	Max. Analyze time (s)	Detection
LECO SC - 432	~ 250 mg	continuous flow	No limit	C, S: IR- Absorption
LECO CN - 2000	~ 350 mg	fixed bulk volume	~ 100 s	C: IR- Absorption N: TC
LECO CNS - 2000	~ 350 mg	fixed bulk volume	~ 100 s	C, S: IR- Absorption N: TC

Combustion Temperature up to 1400°C in case of S-Determination



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Calibration „curves“

- IR-Absorption method: should be a linear or quadratic calibration curve
- Thermo-conductivity: should be a linear calibration curve

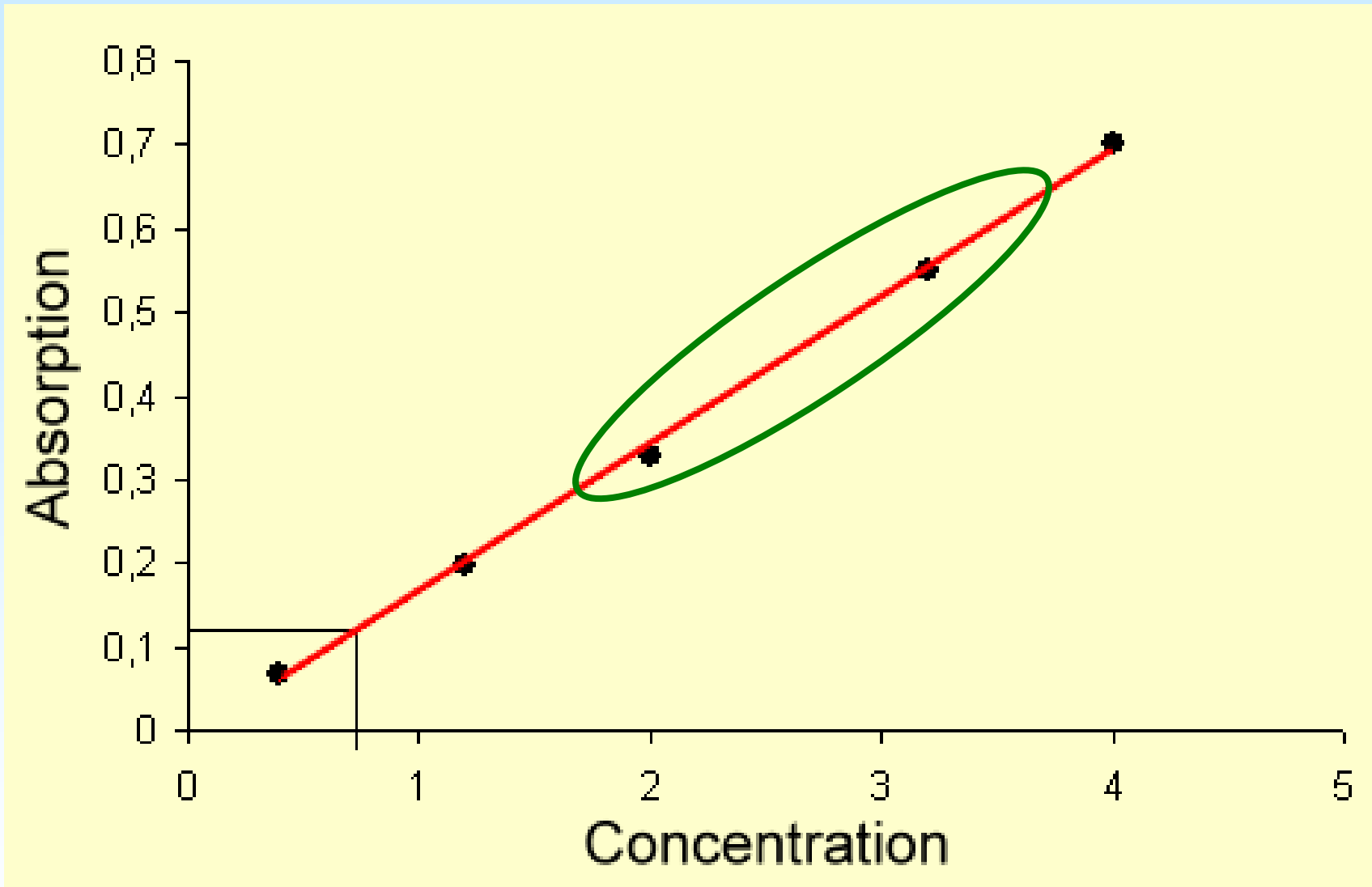


Some common Standards for Calibration of CNS Analyzers

	%C	%N	%S
Sulfanilic-acid	41,6	8,1	18,5
Sulfamethazine	51,78	20,13	11,52
Acetanilide	71,1	10,4	-
EDTA	40,98	9,56	-
Spruce	~52	~1,5	~0,10



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Some Common Standards for Calibration of CNS Analyzers

	C mg	N mg	S mg
Sulfanilic-acid	375,0	55,6	1,6
Sulfamethazin	301,3	22,4	2,6
Acetanilide	219,4	43,3	-
EDTA	380,7	47,1	-
Spruce	300 mg Sample		



Calibration of CNS Analyzers

- Prepare a bigger amount of foliage sample or use fine wheat flour (~35% C, ~2,5% N, ~0,2% S)
- Determine the C, N, S concentration from this sample with three separate calibration curves for C, N and S
- Use this sample for calibration and/or drift correction
- Check the calibration curve with a common standard material for each element (=different sample weight)



Wheat Flour

- Buy a bigger amount
- Dry it totally at 125°C for 48 hours
- Homogenize
- Analyze the C, N, (S) concentration
- Put it in PE-Bottles
- Store it deep frozen at -20°C
- Before use - dry it once more; check the concentrations with reference material

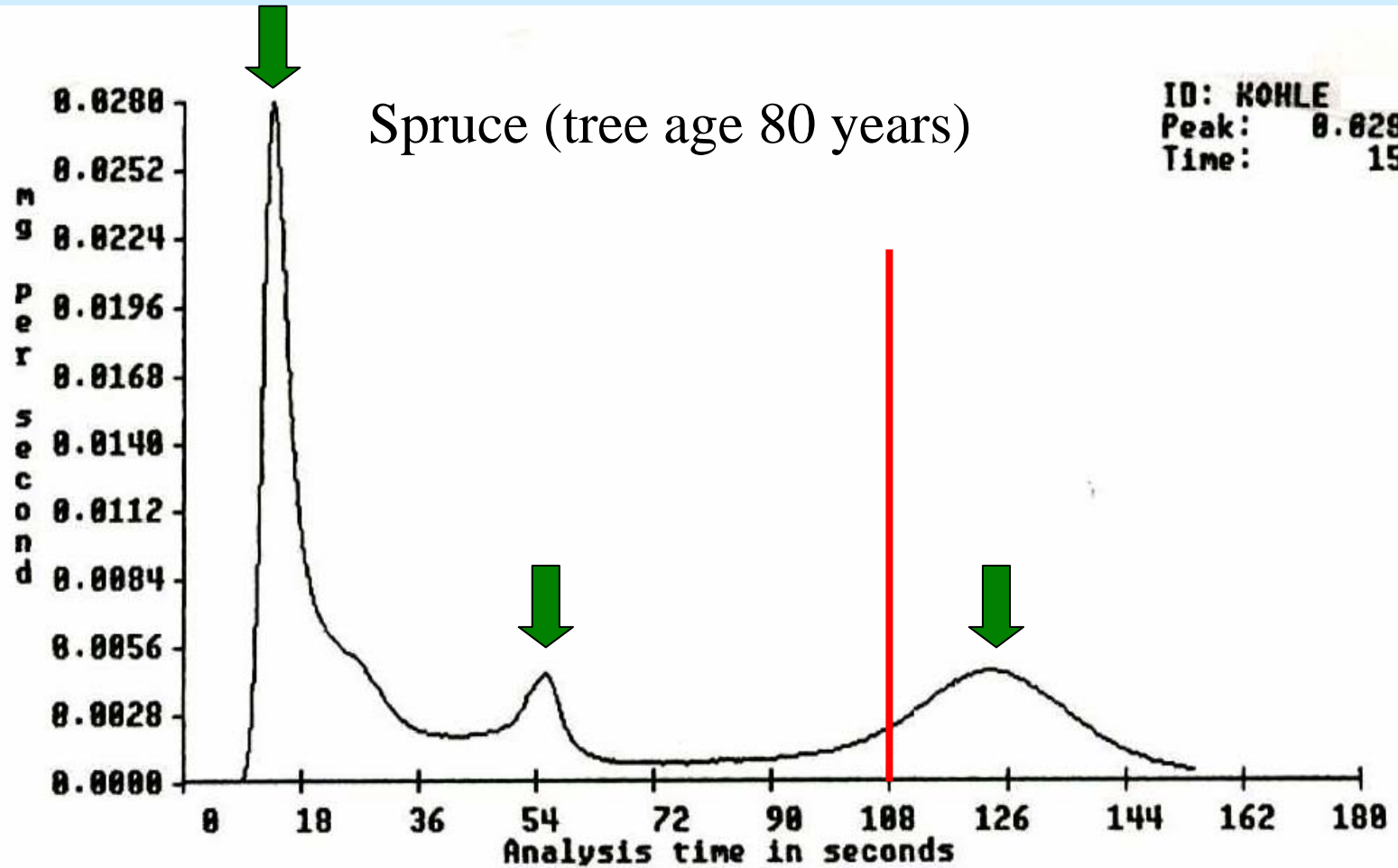


Differences between LECO Sulphur Analyzers

- SC 432 – IR-Detection
 - continuous flow –
 - no limit for the analyze time
 - set a maximum analyze time
- CNS 2000 - IR-Detection
 - bulk volume (3,5 l)
 - analyze time (maximum ~100s)

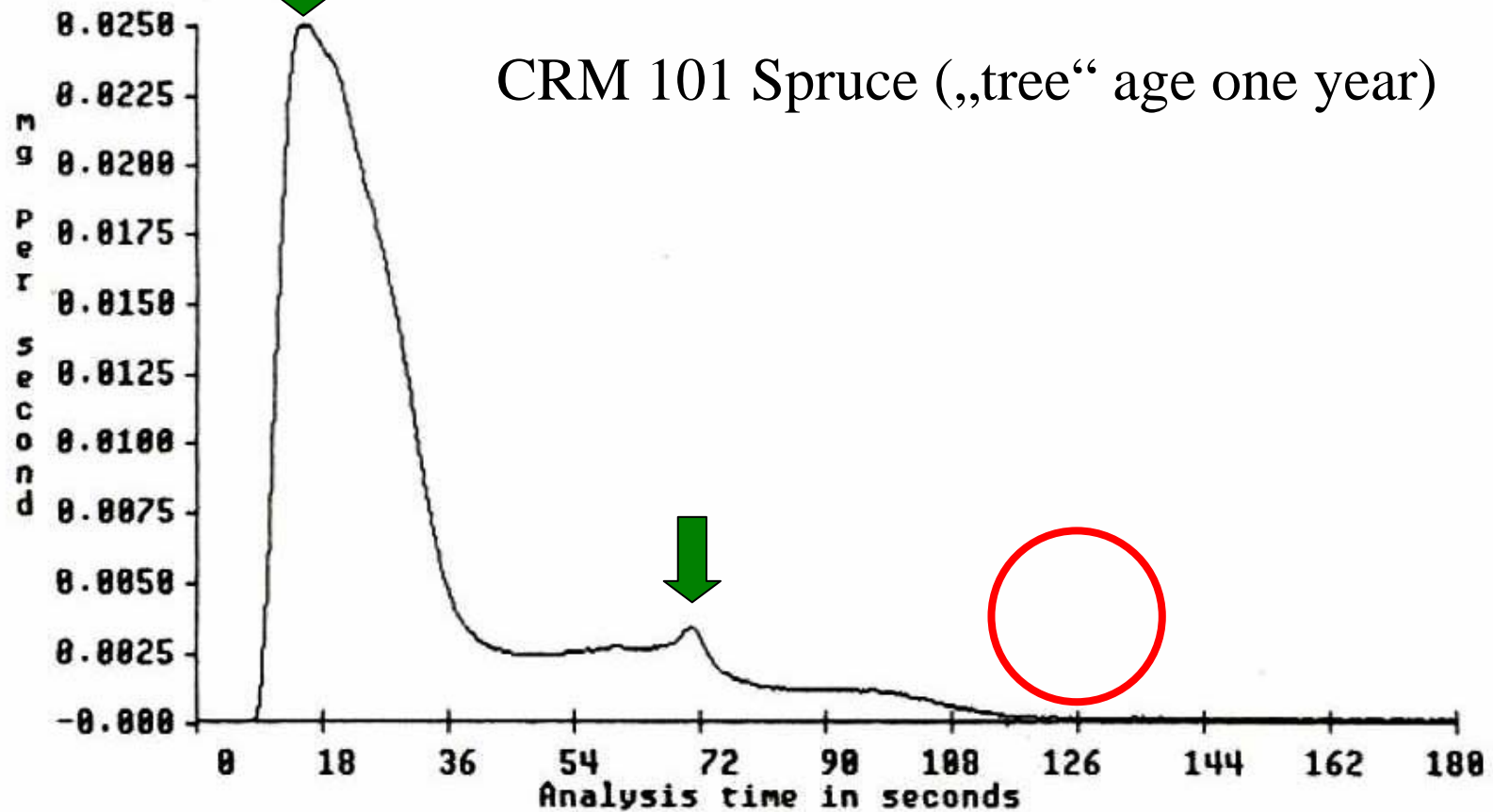


Sulphur - LECO SC 432



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Sulphur - LECO SC 432



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