



ZA3000

Analysis of Sb in Iron and Steel (Electrothermal Method)

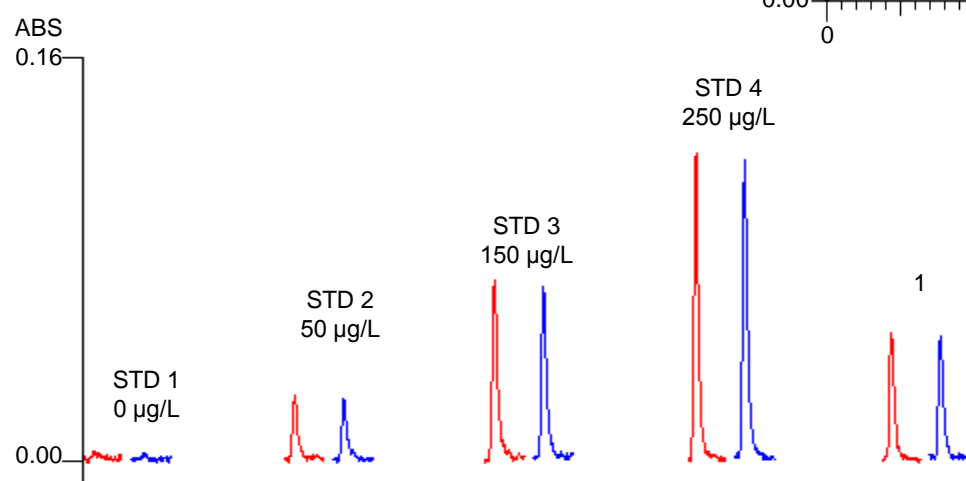
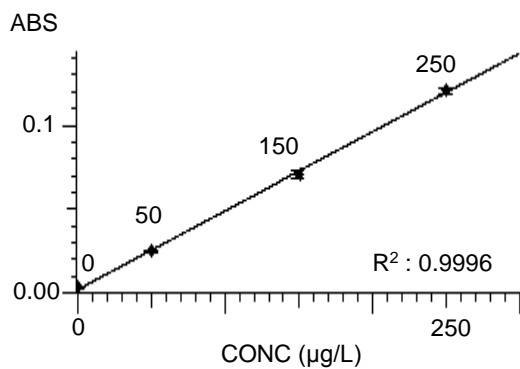
INTRODUCTION: The analytical line of Sb is 217.6 nm and it is close to 217.8 nm, the absorption line of Iron. ZA3000, with the polarized Zeeman correction method, allows the analysis of Sb without the spectral interference by Fe. By using the calibration curve generated by performing the matrix matching with pure iron, antimony in iron and steel can be accurately analyzed. For the Sb in NIST SRM2167, the analysis value well-matching the certified value was obtained. The inner surface of the cuvette (Pyro D HR) specially designed for the twin injection function does not deteriorate easily and stable data with little absorbance change can be obtained.

INSTRUMENT CONDITIONS	MEASUREMENT PARAMETERS	GA AUTOSAMPLER
Element : Sb	Meas. Mode : Working Curve	Sample Volume : 10 μ L
Instrument : ZA3000	Signal Mode : BKG Corrected	Addition : Speed : 3
Atomization : GA	Curve Order : Linear	MATRIX MODIFIER
Wavelength : 217.6 nm	Calculation : Peak Height	Matrix Modifier : 1000 mg/L Pd/Mg
Lamp Current : 10.0 mA	Time Constant : 0.1 sec	Volume : 10 μ L Order : After
Slit Width : 0.4 nm	Temp. Control : ON	
Cuvette : Pyro D HR		

TEMPERATURE PROGRAM					NOTE
Stage	Initial / Final Temperature ($^{\circ}$ C)	Heating / Keeping (sec)	Gas Flow Rate (mL/min)	Gas	Sample : Special Low Alloy Steel NIST SRM2167 Sb:0.0020 \pm 0.0005% Sample Preparation: 1.00 g of the sample was weighed out and 5 mL of hydrochloric acid and 5 mL of nitric acid were added. After heating to dissolve, the total volume was made up to 200 mL.
1 Drying	50 / 110	40 / 0	200	Normal	
	110 / 300	20 / 0	200	Normal	
2 Incineration	600 / 600	20 / 0	200	Normal	
3 Atomization	2300 / 2300	0 / 3	30	Normal	
4 Cleaning	2800 / 2800	0 / 4	200	Normal	

	CONC (μ g/L)	Mean ABS	SD	RSD	REF	ABS
STD 1	0.00	0.0032	0.0006	18.75 %	0.0585	
STD 2	50.00	0.0251	0.0006	2.39 %	0.0714	
STD 3	150.00	0.0706	0.0019	2.69 %	0.0761	
STD 4	250.00	0.1208	0.0018	1.49 %	0.0725	
1	101.92	0.0500	0.0011	2.20 %	0.0737	

$101.92 (\mu\text{g/L}) \times 200 (\text{mL}) / 1.0 (\text{g}) = 20.384 (\mu\text{g/g}) = 0.0020\%$



KEY WORDS
 Material/Processing Material Related, Iron, Industrial Chemistry, Iron and Steel, Antimony, Sb, Flameless, Graphite Furnace, AA, ZA3000, ZA3700, GA, Pyro D HR, Material

Atomic Absorption Photometer (AA)
 Sheet No. AA140006-00