ZA3000

Analysis of Pb in Food Additives (Flame Method)

INTRODUCTION: The test method for purity in food additives is specified in the Japanese Standards of Food Additives. The Heavy Metal Limit Test in which the color reaction of lead is expressed in a numerical value is employed for the test of heavy metals. The current component specification is 10 – 20 µg/g, calculated as lead. However, to harmonize with the international specification by JECFA, it is predicted that the specification will become applicable only to lead and the value will be lowered. ZA3000 series instruments employ the polarized Zeeman method for BKG corrections even for the flame method. The accurate BKG corrections and stable baseline allow the analysis of 2 µg/g of lead in food additives.

ANALYTICAL CONDITIONS

Element	: Pb	Atomizer	: STD Burner
Instrument	: ZA3000	Flame	: Air-C_2H_2
Atomization	: Flame	Fuel (C_2H_2)	: 2.0 L/min
Wavelength	: 283.3 nm	Oxidant (Air)	: 160 kPa
Lamp Current	: 7.5 mA		15.0 L/min
Slit Width	: 1.3 nm	Burner Height	: 7.5 mm

MEASUREMENT PARAMETERS

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Meas. Mode	: Working Curve
Signal Mode	: BKG Corrected
Curve Order	: Linear
Calculation	: Integration
Time Constant	: 5.0 sec
Calculation Time	: 5.0 sec
Delay Time	: 5 sec

NOTE : 1: L-Ascorbic acid, 2: Potassium nitrate
1 g of each sample was weighed out and the volume was made up to 50 mL with purified water.
Addition recovery rate: (Sample 1: 90.5 %), (Sample 2: 92.0 %)
* The addition of 2 µg/g of Pb to the sample will result in 0.04 mg/L of Pb in the solution.

	CONC (mg/L)	Mean ABS	SD	RSD	REF
STD 1	0.0000	0.00002	0.00001	50.00 %	-0.00085
STD 2	0.0500	0.00039	0.00000	0.00 %	-0.00123
STD 3	0.1000	0.00075	0.00003	4.00 %	-0.00157
STD 4	0.2000	0.00154	0.00001	0.65 %	-0.00198
1	ND	0.00001	0.00001	00.00 %	-0.00242
1+ Pb 2 µg/g	0.0362	0.00029	0.00001	3.45 %	-0.00271

0.0362 (mg/L)×50 (mL)/1(g) = 1.81(µg/g)

	CONC (mg/L)	Mean ABS	SD	RSD	REF
2	ND	0.00001	0.00001	00.00 %	-0.00258
2+ Pb 2 µg/g	0.0368	0.00029	0.00000	0.00 %	-0.00302

0.0368 (mg/L)×50 (mL)/1 (g) = 1.84 (µg/g)
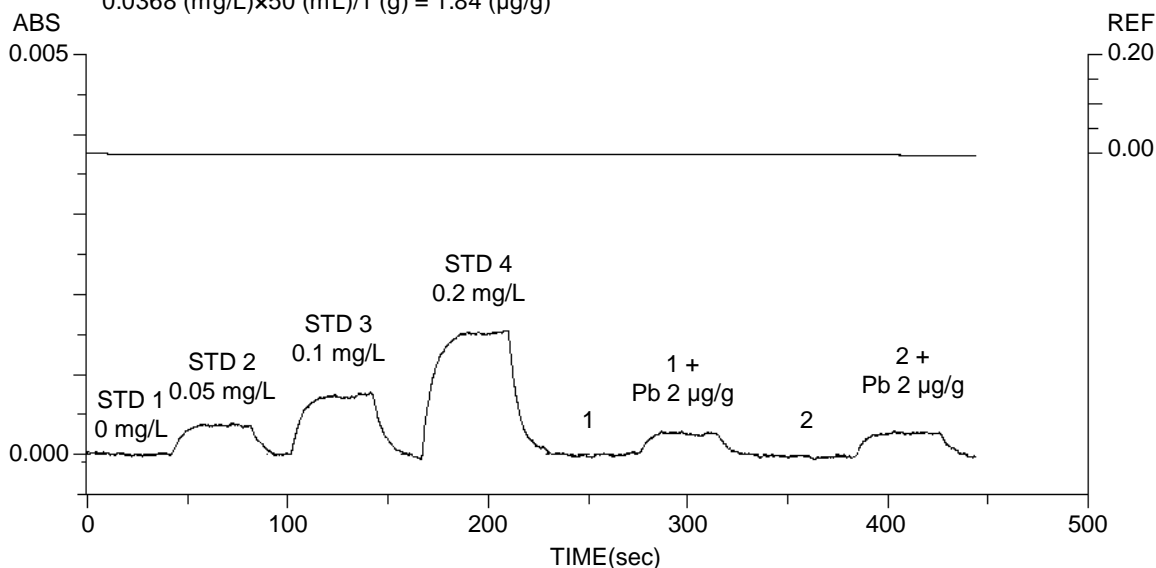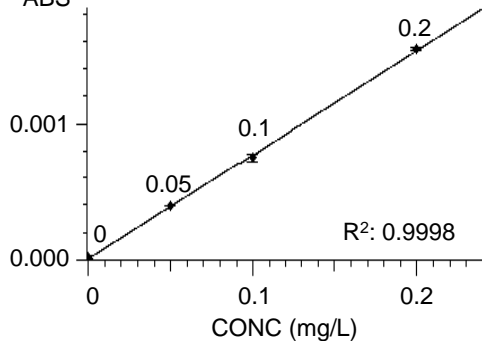
KEY WORDS
Bio/Medical Science/Food/Pharmaceutical, Food, Food Chemistry, Food Additive, L-Ascorbic Acid, Potassium Nitrate, Lead, Pb, Flame, AA, ZA3000

Atomic Absorption Photometer (AA)

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