



**ZA3000**

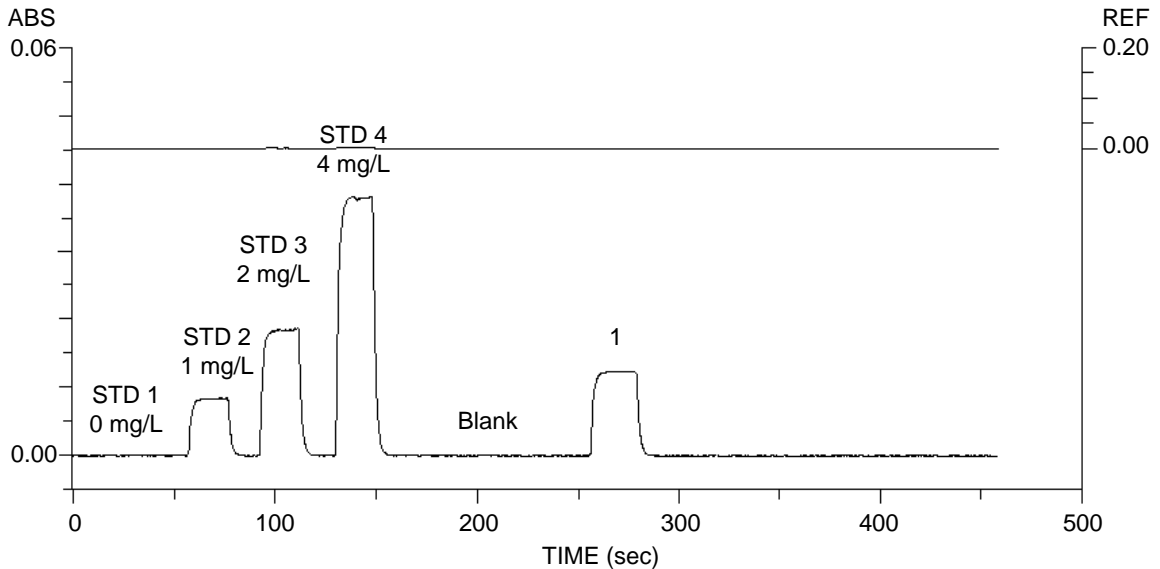
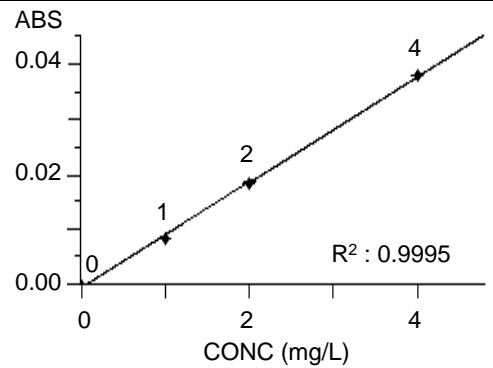
## Analysis of Pb in Urban Particulate Matter (Flame Method)

**INTRODUCTION:** By the spreading of the exhaust fumes from factories, automobiles, etc., and soil, dust containing lead compounds may be suspended in the air. Air Pollution Control Act (Law No. 97 of 1968) specifies the discharge standard (10 – 30 mg/Nm<sup>3</sup>) for the lead compounds discharged or scattered from a stationary source (factory or workplace). Some PM2.5 for which the environmental standard was established in 2009 may contain lead. ZA3000 series instruments employ the polarized Zeeman method for BKG corrections even for the flame method. The accurate BKG corrections and a stable baseline allow the accurate analysis of lead at low concentrations.

INSTRUMENT CONDITIONS		MEASUREMENT PARAMETERS
Element : Pb	Atomizer : STD Burner	Meas. Mode : Working Curve
Instrument : ZA3000	Flame : Air-C <sub>2</sub> H <sub>2</sub>	Signal Mode : BKG Corrected
Atomization : Flame	Fuel (C <sub>2</sub> H <sub>2</sub> ) : 2.0 L/min	Curve Order : Linear
Wavelength : 283.3 nm	Oxidant (Air) : 160 kPa	Calculation : Integration
Lamp Current : 7.5 mA	15.0 L/min	Time Constant : 1.0 sec
Slit Width : 1.3 nm	Burner Height : 7.5 mm	Calculation Time: 5.0 sec
		Delay Time : 5 sec

**NOTE :** [Preparation] 7 mL of nitric acid and 1 mL of hydrofluoric acid were added to 0.102 g of the sample and the mixture was heated for dissolution by a microwave oven. After cooling, the volume was made up to 50 mL with purified water. The 10 times diluted solution was used for the measurement.  
 Sample No.1: NIST SRM 1648 Urban Particulate Matter

	CONC (mg/L)	Mean ABS	SD	RSD	REF	ABS
STD 1	0.00	0.0000	0.0000	- %	-0.0007	
STD 2	1.00	0.0083	0.0000	0.00 %	-0.0002	
STD 3	2.00	0.0184	0.0001	0.54 %	0.0004	
STD 4	4.00	0.0379	0.0000	0.00 %	0.0017	
Blank	ND	0.0000	0.0000	- %	-0.0015	
1	1.35	0.0123	0.0001	0.81 %	-0.0007	
$1.35 \times 0.05 \text{ L} \times 10/0.102 \text{ g} = 6.618 \text{ mg/g} = 0.662 \text{ wt.}\%$						
Certified value: NIST SRM 1648		0.655 ± 0.008 wt.%				



**KEY WORDS**

Environmental Analysis Related, Air, Environmental Chemistry, Urban Particulate Matter, Lead, Pb, Flame, AA, ZA3000, Environment, NIST SRM 1648

Atomic Absorption Photometer AA

Sheet No. AA120035-00