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Title: The Calibration of Perkin Elmer (PE) Model 5100 ZL Atomic Absorption Spectrometer: Graphite Furnace

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TITLE: STANDARD OPERATING PROCEDURE FOR THE CALIBRATION OF PERKIN ELMER (PE) MODEL 5100 ZL ATOMIC ABSORPTION SPECTROMETER: GRAPHITE FURNACE

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CALIBRATION OF PERKIN ELMER (PE) MODEL 5100 ZL ATOMIC ABSORPTION SPECTROMETER: GRAPHITE FURNACE

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1.0 INTRODUCTION

The PE 5100 ZL atomic absorption spectrometer is used for the analysis of metals. The calibration procedures described below are designed to assure the consistent performance of the graphite furnace unit as a whole. The individual components of the system are not subjected to separate calibration procedures.

2.0 CALIBRATION

2.1 Performance Check

The instrument operator will run an annual performance check for the graphite furnace portion of the instrument, as described in the PE Reference Manual, Section 4-14. The performance check consists of replicate injections of a copper reference standard solution under specified conditions. The atomic signal and Zeeman background signal are compared to figures provided by the manufacturer. Results will be recorded in the Maintenance/Repair section of the Instrument Logbook. If the minimum performance specifications are not met and the instrument cannot be brought into specifications through the troubleshooting procedures in the Reference Manual (Table 4-2) then a PE Service representative will be consulted.

A Performance Check will be done by the instrument operator or a PE Service technician after any major repairs to the Zeeman furnace unit or the spectrometer. Results will be recorded in the Repair/Maintenance section of the Instrument Logbook.

2.2 Wavelength Calibration

Optical alignment and wavelength accuracy are monitored by the instrument operator. During the daily lamp alignment and optimization procedure, a scan is taken of a 1 nm window around the analytical wavelength. The peak maximum is recorded in the Instrument Logbook. If the peak maximum is more than ±0.2 nm from the nominal analytical wavelength, the problem should be traced to a faulty hollow cathode lamp or other optical component. The hollow cathode lamp should be replaced if faulty. If the instrument

operator and laboratory supervisor determine that the optics are the source of the problem, a service call should be placed to RTI technical service personnel or the PE service technician.

3.0 DOCUMENTATION

All calibration data and procedures are recorded in the daily log section of the Instrument Logbook by the instrument operator. Any corrective actions or repairs are recorded in the Repair/Maintenance section of the Instrument Logbook.

4.0 QUALITY ASSURANCE

Calibration data will be reviewed by the laboratory supervisor, or by the PE Service technician.

5.0 REFERENCES

1. Perkin Elmer Corp., Model 5100 PC Atomic Absorption Spectrometer Referemce Manual, Norwalk, CT 1987.

2. Perkin Elmer Corp., Model 5100 PC Software, Version 5, Supplemental Information, Norwalk, CT, 1990.