Standard Operating Procedure 216
Calibration and Verification of a Thermo Environmental Model 580B PID

Purpose

1. Use this procedure to systematically set the output response of the photoionization detector (PID) to a benzene standard.
2. Use the procedure (starting at step 16) to verify that the response of the PID matches the actual concentration of the calibration gas.

Safety Equipment

- Refer to the site-specific Health and Safety Plan for other safety concerns and applicable personal protective equipment.

Required Equipment

- Thermo Environmental Instruments, Inc. model 580B photoionization detector (PID) equipped with a 10.6 or an 11.8 eV lamp (refer to the site-specific sampling and analysis plan or proposal for proper lamp size)

- 100 ppm isobutylene gas cylinder, associated flow regulator, and poly tubing assembly to connect the gas cylinder to the PID

- Photoionization Detector Calibration Record

Procedure

Calibration and verification of the PID is best completed at the job site, however calibration in the office on the day of the work is acceptable.

1. Check the Calibration Record to determine if the appropriate lamp is installed. If not, change the lamp.

2. Check the ceramic filter at the front of the instrument (if present) and the moisture filter in the probe wand. If either filter is dirty, replace with a new filter. Check for dirt in the probe, if it is dirty, clean it and dry it as well as possible.

3. Screw on the probe tip assembly.

4. Push the shorting plug into the back of the instrument and turn the instrument on.

5. Push the MODE/STORE button once. Push the "-" button 5 times to check that the response factor is 0.65, change if necessary. Push the "-" button one more time to check that the lamp setting (10.6 or 11.8) matches the calibration record, change if necessary.

6. Push MODE/STORE twice.

7. Push the "-" button 4 times; Screen says "RESET TO CALIBRATE".

8. Push RESET.

9. Push the "-" button; Screen says "ZERO GAS, RESET WHEN READY".

10. Push RESET (make sure PID is in "zero" air).

11. When "Zeroed" screen says 'SPAN PPM = 0100, "+" TO CONTINUE'. CHECK calibration gas concentration, push RESET to change if necessary.

12. Push (+); Screen says "SPAN GAS - RESET WHEN READY".

13. Attach the gas source to the probe with the poly tubing and completely open the valve on the calibration gas; push RESET.

14. When the instrument has completed its automatic calibration the screen displays "RESET TO CALIBRATE".

15. Push MODE/STORE.

16. Calibration Verification. Close the valve on the calibration gas and check to make sure the instrument reading returns to 0. With the gas source attached to the PID with the poly tubing, open the valve on the calibration gas and check to make sure the instrument reading equals the calibration gas concentration multiplied by the response factor (e.g., 100 ppm x 0.65 = 65 ppm). If the zero air or calibration gas reading varies more the 2 ppm from the expected reading, repeat the calibration starting at step 7.

17. Close the calibration gas valve and disconnect the gas source.

18. Record the date and time of the calibration or verification on the Calibration Record sheet along with the test status.

19. If the calibration does not complete normally, or if the instrument will not produce the expected reading during the calibration verification, note the failure and attempted remedy on the Calibration Record. After attempting a remedy, repeat the calibration from Step #1. If the calibration does not produce the expected result contact the office to obtain instructions for other potential remedies or to obtain a replacement photoionization detector. Do not use a PID that does not calibrate properly.