

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY  
SOURCE TEST CALIBRATION METHOD IV  
BARTON ANALYZER CALIBRATION

I. Principle

The Barton Titrater is calibrated by means of standard atmospheres of H<sub>2</sub>S supplied by gravimetrically calibrated permeation tubes over a range of zero to 60 ppm.

II. Equipment

- (1) Barton Titrater, with cells and chart recorder.
- (2) H<sub>2</sub>S permeation tubes, gravimetrically calibrated for emission rates at 25 degrees C.
- (3) Calibrated flowmeters, calibrated wet test meter, Teflon tubing, Teflon and glass control valves, glass manifold with gas mixing tubes, constant temperature bath pump.

III. Procedure

Set up and adjust the Barton with the necessary connections for sampling from the permeation tubes immersed in the constant temperature bath. Install calibrated flowmeters and pump to supply the required air flow to the Barton via the manifold. Allow adequate time for equilibration of the permeation tubes at the set temperature. Sample four (4) upscale concentrations of gas starting with a blank determination on zero air, and including a zero blank between each concentration. Repeat any unstable traces and allow at least 15 minutes of recording at each concentration point. The necessary recorded values should be at 20%, 40%, 60% and 80% of full scale.

IV. Calculations

Calculate the four standard atmospheres as concentrations of H<sub>2</sub>S in ppm, according to the following formula: .

$$\text{H}_2\text{S (ppm plus or minus 5\%)} \text{ equals } \frac{.719 \times P \times L}{\text{Flow}}$$

P is Permeation rate in ng/min./cm tube length.

L is the length of permeation tubes used for concentration point.

Flow is the total sample flow over the tubes into the manifold.

Plot both calculated and recorded concentration points vs. 0–100 chart div. as a calibration curve.

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY  
BARTON TITRATER CALIBRATION

Date \_\_\_\_\_

Permeation Tubes Used:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Permeation Rate @ 25 degrees C

\_\_\_\_\_ ng/min

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Calculated H<sub>2</sub>S Concentration (ppm)

1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
4. \_\_\_\_\_

Barton Recorder Reading

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Plot both calculated values and Barton recorder values vs. 0 – 100 chart division. The plot should be linear, an respective point values should agree within plus or minus 5%.