

EPA's APTI
Course #450/468

***Monitoring Compliance Testing
and
Source Test Observations***

Problem Set 2

1. A 60-minute stack test gave intermediate data as follows:
 - % H₂O in stack gas = 6.5 %
 - Volume metered at standard conditions = 38.8 dscf
 - Static pressure in the stack = -0.25 in H₂O
 - Barometric pressure = 30.30 in. Hg
 - Actual Nozzle diameter = 0.248 in.
 - Avg. stack gas velocity = 49.8 ft/sec
 - Avg. stack temperature = 296 °F

What is the percent isokinetic for this source test?

2. How would your result in Problem 1 change if you found after the test that your estimation of the moisture content was incorrect and that the actual value for stack gas moisture was 7.3%?
3. A 60-minute source test conducted at an oil-fired steam generation facility provided the following information:
 - Average stack temperature = 300 °F
 - Average stack gas velocity = 50.0 ft/sec
 - Volume sampled (meter box) conditions = 40 ft³
 - Average temperature at the meter box = 70 °F
 - Static pressure in the stack = + 0.2 in H₂O
 - Barometric pressure = 30.26 in. Hg
 - Average pressure differential across the orifice (ΔH) = 1.5 in. H₂O
 - Dry gas meter correction factor = 1
 - Water collected in the impingers = 100 g
 - Sampling nozzle diameter = 0.250 in.
 - K₄ as 0.002669

What is the percent isokinetic for this source test?

4. FRM 4 for determination of moisture content of a stack gas was completed at a coal-fired power plant duct. From the following data, calculate the % H₂O present in the stack gas.

- V_{metered} = 45 cf
- Test time = 60 minutes
- t_m = 90 °F
- T_s = 80 °F
- P_m = 30.25 in Hg
- Total H₂O volume increased in the two impingers = 125 g of total water increase
- H₂O weight increase in silica gel = 20.6 gm total weight increase
- $\gamma = 1.0$