

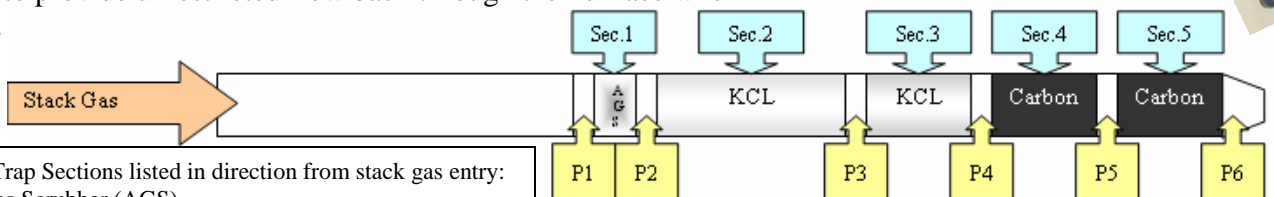
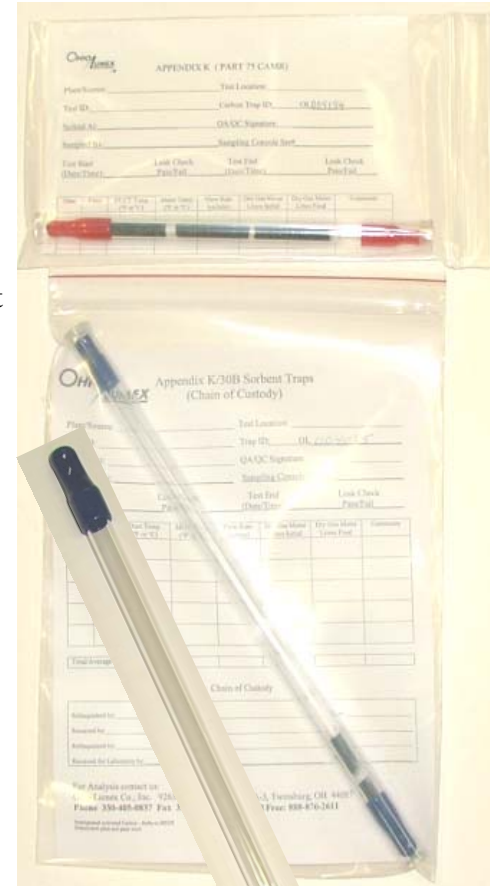


Testing and Analyzing Speciation Traps

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1. Do not expose trap at the stack to over 100°C. Use cooling probe. Lower temperature is better, however, avoid condensation – keep the trap at a sufficient temperature (20°-30°C) above the Dew point of the testing stack gas. Keep at 100°C for “wet” sources. Recent data (Dry stack at 150°C- proved that short term (30minutes) testing can be done without cooling the probe- just cool probe to ambient temperature before setting traps in the fittings.
2. Pull low flow through the traps (200-300 ml/min) to avoid breakthrough on the KCL bed. Recent data—flow up to 1000ml/min (with cooling) is OK.
3. Install trap in probe fitting with section 1 (white section) facing stack gas.
4. Calibrate analyzer as per method 30B using carbon as calibration substrate and check one point using KCL as calibration substrate. Change the Temperature set point on Watlow controller to 590°C. Only one calibration curve is required for carbon and KCL. Analyze all traps including M30B traps (Speciation and Total Hg) at this temperature with this calibration. Use ceramic ladles for analysis. Always use soda on top of KCL or carbon. Change Flow to 2LPM on the pump. For exceptionally low levels (single ng’s) use 1 LPM flow.
5. After heating in the furnace, let the ladle cool before cleaning off residue. Remove sticking residue by gently scraping the ladle or washing it in water. Melting or fusing of the KCL with soda indicates overheating so you must drop the temperature on the controller 10 or 20 degrees. Average analysis time is 180-220 seconds. Wait for KCL peak to come back to baseline (it will “tail”!) Extended analysis time in the furnace (over 250 sec) indicates that the temperature is low.
6. Wash ladle with water at the end of the day of testing.
7. Do not pull the glass wool through the trap (ash bonded mercury will bias the results.) Cut the traps with Dremel fitted with diamond wheel cutter right before the front plug.
8. Wrap the plug wool in aluminum foil before ladle goes in the furnace!
9. You may combine first, second, and third wool plugs (P1, P2, P3) to save on analysis time. You may analyze section 1 (acid gas scrubber) and section 2 (1st bed of KCL) together. Do the same for plugs (P4, P5) with section 4 (Carbon).
10. There is no reason to analyze the last (P6) plug. Oxidized mercury is equal to loading on sec. 1 (acid gas scrubber), sec. 2 (KCL), and (P1, P2, P3) combined.
11. Important! KCL bed must be coated with thick layer of soda and soda must be pressed on top of the KCL using a sheet of Aluminum Foil.
12. Try not to spill soda in the oven. Clean oven (once per week) with vacuum cleaner nozzle approaching from the ladle intake port. Disconnect silicone lines after the furnace to provide unrestricted flow back through the Furnace when vacuuming.



Speciation Trap Sections listed in direction from stack gas entry:

1. Acid Gas Scrubber (AGS)
2. Oxidized Mercury Analytical Bed
3. Oxidized Mercury Breakthrough Bed
4. Elemental Mercury Analytical Bed
5. Elemental Mercury Breakthrough Bed