Moisture Measurement Best Practices Review

**Recommendations for trace (ppb) Moisture Measurement**

a. Use a regulator specified for ultra-high purity gas applications.
b. Use 3 and/or 4-way valves specified for UHP applications to flow dry purge gas to the sample line.
c. Use electropolished stainless steel gas lines throughout (1/8” or ¼” are both OK).
   i. Teflon permeates ambient moisture and should never be used.
   ii. Tubing with internal physical “features” (e.g. flexible “bellows” tubing) will trap moisture molecules and should never be used.
d. Use VCR connections throughout.
e. Use new VCR gaskets each time a connection is made; do not expose the gaskets or caps to dust.

**An Example of a Sampling System That Will Help Improve the Speed of Response for Moisture Analysis**

- **Normal operation for Sample Cylinder measurement:**
  - The 4-way valve is configured for A → X and B → Y.
- **To purge the analyzer with inert gas:**
  - The 4-way valve is configured for A → Y and B → X.
- **Procedure to swap cylinders**
  1) Configure the 4-way valve for A → Y and B → X.
  2) Close the sample cylinder valve and wait for the flow (or pressure) to deplete at (FP1). *Do not let it deplete completely, to make sure that there is no backflow into the line.*
  3) Close the 2-way valve (V1).
  4) Configure the 3-way valve to reverse-purge through the cylinder regulator.
  5) With purge gas still flowing, remove the old cylinder and install the new cylinder. *This step requires additional safety measures for certain sample matrix, as the sample gas will flow out of the cylinder regulator. A ventilation hood may be needed.*
  6) Switch the 3-way valve so the cylinder sample will flow through B → X.
  7) Open the cylinder.
  8) Open (V1).
  9) Cycle-purge the cylinder regulator and the sample lines: (a) Close the sample cylinder valve and wait for the flow (or pressure) to deplete at (FP1). *Do not let it deplete completely, to make sure that there is no backflow into the line.* (b) Open the cylinder to re-establish flow. Repeat (a) and (b) at least 10 times. (Some customers perform this cycle-purge many more times).
  10) Configure the 4-way valve for normal cylinder sample measurement: A → X and B → Y.