What is My Vaporizer Temperature?*

Paola Massoli, Leah Williams, Ed Fortner
Aerodyne Research, Inc.
2/22/2010

* It's not necessarily what the thermocouple readout says!

Mixing tube:
Cole-Parmer ¼" OD, 21 element
EW-04669-56
$128
From Rami Alfarra thesis (Q-AMS data)

Nitrate (from NH4NO3) and sulfate (from (NH4)2SO4 as function of temperature. Peak in nitrate and plateau in sulfate at ~550 C.

C-ToF-AMS at BC, signal as function of vaporizer T

Peak in nitrate, plateau in sulfate harder to see than in Rami's data. T/C says 490 C.
Note that we started the (NH₄)₂SO₄ at too high a vaporizer current because we were looking at T/C readout!

Gaussian doesn’t describe tail due to slow vaporization, but gives estimate of width.
NaNO₃ PToF at m/z30 nice and sharp by 1.4 A, 700-750 C. Vaporizer glowing dull orange from back.

**Bottom Line**

- If vaporizer current is NOT 1 to 1.1 A, need to check true vaporizer temperature!
- Warning: T/C readout can be off by 100’s of C.
- Look for peak in NH₄NO₃ nitrate, plateau in (NH₄)₂SO₄ sulfate -> 550 to 600 C.
- Look at NaNO₃ m/z30 PToF. Sharpens up at 700 to 750 C.
- Look at back of vaporizer. If glowing dull orange, 700 to 750 C. (Front of vaporizer is cooler than back.)
- (If vaporizer is 1.2 A and you think T is correct, check the yellow wire inside the electronics box. E-mail John Jayne for details.)