Surface Ionization in the
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terminology consultation from
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Changing Vaporizer Temperature and Heater Bias (HB) while analyzing Triethyl Ammonium Nitrate

Detuned HB → Loading depends on vaporizer temperature
Loadings are too large by significant amounts

Tuned HB → Little dependence on vaporizer temperature

HB = 45.3, T increased from 571 to 706 °C

HB raised to 48.0
(Tuned Correctly)

T = 571 °C
Tuning Heater Bias Does Not Dramatically Affect Species That Ionize By EI

EI Spectrum For Triethyl Amine Showing m/z 86 (alpha cleavage from m/z 101 is dominant)
Higher m/z Show More Surface Ionization
Molecular Ions (m/z 100) Show Greatest Increase
Known EI Ions (m/z 86) Show Little Increase

Trethyl Ammonium Nitrate Chopper Closed
Few Surface Ions Observed
Wide Peaks When HB Untuned (TEA Spectrum)

Surface Ions Delayed Time of Flight
Lab Air, Few Surface Ions Observed

Though not dramatic, we do observe more signal at higher m/z's when HB is detuned.
Conclusions

• cToF is more susceptible to surface ions and HB tuning than quadropole
• Amines and possibly other species are easily ionized on our vaporizer
• For many species, there are few surface ions
• Higher m/z’s appear to have more surface ions than lower m/z’s for all species
The Problem

• When you are near an EMF noise source (Radar, Cell Phone, Houston) your data is extremely distorted

slides are from Igor experiments for HB tuning and for TEA ozonolysis 050806
Possible Solutions

- Suffer
- Convince the entire world to use Verizon cell phones
- Avoid Houston, TX*
- Spend many hours attaching wire to your ToF (result = chickens cannot escape, but noise remains)
- Set bandwidth to a lower number (result = no noise with minimal smoothing for cToF peaks)

*Has numerous other advantages

Aerodyne’s First Problem
And Their Latest

Oh No YOU work for Aerodyne now too???

Before You Go To ToFAMS, CONSIDER THAT
Your Data Depends on Him.....hmmmmmm