

Interactive comment on “Organic and inorganic decomposition products from the thermal desorption of atmospheric particles” by B. J. Williams et al.

Anonymous Referee #1

Received and published: 17 January 2016

The presented manuscript by Williams et al. is very interesting and well written. The paper focuses on a new type of data that highlights the analytical challenges associated with quantitative analysis of organic aerosol using thermal desorption AMS techniques on ambient aerosol. In this work, the authors have focused on decomposition compounds that result from the rapid heating of humidified ambient aerosol in the collection thermal desorption cell used in the TAG instrument. This rapid heating in an inert atmosphere appears to result in both inorganic and organic decomposition fragment ions identified by the AMS. Assuming the ions observed in non-TAG AMS measurements also result from thermal decomposition, the authors compared observations and found agreements. The description of the challenges associated with these measurements

C4931

is adequately balanced and suggests further work to be done in the future.

There are two instrument limitations described in the introduction of the paper (low mass transfer of highly oxygenated OA and ~20% detection) that likely affect the comparison of the TAG measurements to the AMS measurements. However, I did not find them to be discussed in terms of the data comparisons.

Another minor point of consideration is the use of the term "solvent delay". The time period referred to here is also referred to as "thermal desorption period" by the authors. The latter is more technically correct and avoids misunderstanding. Note, the TAG does not employ a solvent injection, thus the term solvent delay is not at all correct. Furthermore, the implication that traditional GC measurements with solvent injections also result in similar thermal decomposition products is also incorrect. This is mainly due to the fact that the analytes injected using a solvent carrier are flash vaporized to the head of the analytical column in the absence of inorganic substances that can catalyze decomposition.

Another very minor point pertaining to terminology on page 13386 should be addressed. Here the authors present a list of the TAG fractions, including non-eluting organics and later non-eluting inorganics. How are non-eluting compounds TAG fractions? Non-eluting compounds are not observed in the TAG instrument because they are irreversibly bound to the analytical column stationary phase, right?

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 13377, 2015.