This study presents a recently developed chemical ionization mass spectrometer with two switching ionization modes for the measurement of organic molecules in the atmosphere. The sensitivity of this instrument is characterized through a voltage scanning procedure that allows for the determination of the stability of detected ion clusters. The application of this instrument is exemplified by the measurement of the composition of SOA generated from methylcatechol photooxidation in laboratory chambers. The manuscript is well written and within the scope of the journal. The following issues need to be addressed prior to publication on AMT.

Page 4, Line 7: How sensitive is the reagent ion intensity to the position of the corona needle?

Page 4, Line 25: Is the 180 C for the air temperature of the thermal desorption region? Is this temperature prone to decompose labile molecules?

Page 4, Line 26: How sensitive is the distribution of reagent ions in the NH4+ mode to the concentration of the ammonium hydroxide aqueous solution?

Page 5, Line 15: This is not exactly the case, as methanol exhibits relatively weaker dependence on humidity than pyruvic acid, biacetyl, and acetone. Is the humidity dependence related to the polarity of the analyte?

Page 5, Line 21: Increasing the analyte and reagent reaction time usually enhances the instrument sensitivity, which may not be simply the case for this study, as it could possibly promotes the reverse ligand-switching reactions. Do the authors have any idea on the ideal reaction time in the ionization chamber?

Page 6, Line 20: For some relatively big molecules such as decanone, their intensities increase with increasing de-clustering voltage. Please explain.

Page 6, Line 30: How did the author take account for the influence of mass-dependent ion transmission through the ion optics on the ion signals?

Page 7, Line 15: Please provide the full mass spectra of all the ions detected, and compare the mass spectra of species in the gas phase with the particle-phase measurements in terms of peak identity and intensity.

Page 7, Line 20: This is a bit surprising, as the sensitivities of many species are largely different from that of acetone in PTR. But on the other hand, the comparison of the mixing ratios of organic compounds detected by both modes shows good agreement. Please evaluate uncertainties in applying a single sensitivity derived from acetone to all the OVOCs detected in the experiment.

Page 7, Line 25: As the NH4+ mode is able to detect larger and more functionalized molecules, how did the authors quantify the losses of these molecules in the CIMS inlet?

Page 12, Table 1: In addition to alcohols, carbonyls, and acids, is the NH4+ mode capable of detecting other species, like peroxides?