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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A case study of aerosol processing and evolution in summer in New York City" *by* Y. L. Sun et al.

Anonymous Referee #2

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This paper reports an aerosol processing event in summer in New York City. AMS offers highly time resolved information on the evolution of major aerosol components during three major stages: wet scavenging, nitrate formation and photochemical production of SOA. This is a well-written paper and could be accepted by ACP after the following issues are addressed:

1) For the first stage, the authors explained well about the wet scavenging of ammonium sulfate mostly based on its high hgroscopicity. However, nitrate (What is the major form of nitrate during this stage, ammonium nitrate?), which is a well-known hygroscopic material, showed little change in concentration during this step. Why? The scavenging rate of nitrate should be presented in Table 1 with more discussion.

2) For the second stage, the heterogeneous reaction followed by neutralization was

proved to be the dominant formation mechanism of nitrate. This night-time nitrate formation had been reported many times in previous studies. The authors should step forward a little and discuss the possible reasons for the high concentrations of NO2 and O3 and low concentration of NO during this period.

3) More explanation should be given for Fig 5 both in caption and text. The definition of dash lines may be well known in AMS society but not for general audience.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 25751, 2011.