This study simultaneously measured gas- and particle-phase water-soluble organic nitrogen, using an online gas and aerosol composition monitoring system, ion chromatography, and a total organic carbon/total nitrogen analyzer. By combining the thermodynamic model, gas-particle partitioning coefficients, and sigmoidal curve analysis, the authors investigated the gas-particle partitioning characteristics of WSON and amines during different pollution stages and evaluated the effects of aerosol liquid water content, particle acidity, and temperature. The overall research framework is relatively complete. The topic is relevant to current research interests in atmospheric chemistry and aerosol science, and the observational dataset has potential value for publication. I therefore recommend acceptance after minor revision.

1. The reported particle-phase WSON concentrations are internally inconsistent

The abstract and Table 1 report an average particle-phase WSON concentration of 2.3 ± 1.4 μg N m^{-3}, whereas Line 192 of the main text reports a value of 2.7 ± 1.6 μg m^{-3}. Line 200 again uses 2.3 ± 1.4 μg N m^{-3}. The authors should re-examine the original dataset, the number of valid observations, and the treatment of missing values, and should ensure that the values reported in the abstract, main text, Table 1, figure captions, and Supplementary Information are fully consistent.

2. The standard deviation and concentration range of nitrate during the clean period in Table 1 are clearly incompatible

Table 1 reports a NO_3^- concentration of 6.4 ± 32.1 μg m^{-3} during the clean period, with a concentration range of 2.9–11.0 μg m^{-3}. A standard deviation of 32.1 μg m^{-3} is mathematically impossible within this range. This value is likely a typographical or calculation error, possibly 3.2 or 3.1 μg m^{-3}? The authors should thoroughly verify all values in Table 1, with particular attention to whether the data for the polluted and clean periods have been placed in the wrong columns and whether the units and significant figures are consistently reported.

3. The matching of datasets with different time resolutions and the effects of temporal autocorrelation should be incorporated into the statistical analysis. The temporal resolution of the WSON measurements was 3 h, whereas the temporal resolutions of the other ions, amines, and meteorological parameters were 1 h. The manuscript does not specify whether the hourly data were averaged over the corresponding 3 h WSON sampling intervals or whether the WSON data were interpolated to an hourly resolution.

4. Lines 320–327 state that amines are almost completely protonated at aerosol liquid water pH values of 0–5 and are therefore insensitive to changes in pH. This explanation conflates two distinct concepts: the fraction of dissolved amines that is protonated in the aqueous phase and the overall gas-particle partitioning fraction. Even when dissolved amines are predominantly protonated, their effective Henry's law constants and total gas-particle partitioning may remain strongly dependent on pH. Ge et al. (2011) explicitly discussed the coupled dependence of amine partitioning on particle acidity, activity coefficients, and aerosol water content. The potential influence of pH therefore cannot be excluded solely on the basis of the dominant protonation state. DOI: 10.1016/j.atmosenv.2010.10.013. Pankow (2015) similarly emphasized that amine protonation, aerosol phase state, and volatility should be treated within a unified phase-equilibrium framework. DOI: 10.1016/j.atmosenv.2015.09.056.

Based on the sigmoidal curve analysis, the manuscript concludes that "pH and temperature exert relatively weak effects on amine partitioning, whereas ALWC is the dominant factor."

However, the observed $PM_{2.5}$ pH range was only 3.4–5.0, as shown in Table 1. The sigmoidal curves in Figure 5 indicate that the protonation plateaus of MA and DMA, where ε is approximately 100%, extend to approximately pH 5–6, after which the protonated fractions begin to decline sharply.

Thus, nearly the entire observational dataset falls within the flat plateau region of the sigmoidal curves and does not cover the pH-sensitive transition region, approximately pH 6–8. The authors should reinterpret Figure 5 and revise the conclusion as follows: within the observed pH range and the uncertainty of the available measurements, no significant independent pH dependence was detected. The current dataset does not support the broader mechanistic conclusion that pH is intrinsically unimportant for amine partitioning.

5. Inappropriate citation regarding the volatility of organic nitrates

The citation of Pleim and Ran (2011) in Lines 53–55 is not appropriate for the discussion of the volatility of monofunctional and multifunctional organic nitrates. That paper primarily addresses surface fluxes in air quality models rather than the gas-particle partitioning of organic nitrates. DOI: 10.3390/atmos2030271.

The authors should replace this reference with studies that directly investigate the volatility, phase partitioning, or effective saturation concentrations of organic nitrates.

6. Incorrect publication year for the IMPROVE_A paper by Chow et al.

For the IMPROVE_A paper by Chow et al., Volume 57, pages 1014–1023 correspond to the formal publication year of 2007, whereas the manuscript lists the year as 2012. Both PubMed and the journal record identify the publication information as 2007. DOI: 10.3155/1047-3289.57.9.1014.

The authors should verify and correct the publication year in both the main text and the reference list.