Comment on amt-2021-184

Anonymous Referee #2

Referee comment on "A study on the fragmentation of sulfuric acid and dimethylamine clusters inside an atmospheric pressure interface time-of-flight mass spectrometer" by Dina Alfaouri et al., Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2021-184-RC2, 2021

Alfaouri et al. conducted an investigation of the fragmentation of 11 sulfuric acid and dimethylamine clusters in the atmospheric pressure interface (APi) mass spectrometer. A DMA was used as the ion cluster classifier (prior knowledge of the ion). The results successfully reconstructed the mass spectrum by considering the fragmentation of clusters in the APi. The study presented a complete calibration procedure of ion cluster fragmentation and will be of great interest to the community. I recommend acceptance of the manuscript after some minor revisions:

1. Where is the background signal of the 1B ion from? Does it suggest that M1B->M+1B is a common fragmentation pathway in APi (M is an arbitrary cluster)? This should be clarified in the caption of Figure 2 or the main text.

2. How is the fragmentation rate threshold (10^3 s^{-1}) determined? Why is it the same for all the ion clusters? If the fragmentation time in the APi is the limiting step, how is that value estimated? I think this should be included in the main text.

3. This study presented the calibrated mass spectrum from DMA+APi-MS. But when we just have the APi-MS spectrum, how can this study be used to retrieve the concentrations (or relative intensities) of the clusters in the air sample that have the potential to fragment in the APi?