Referee #1

This manuscript presents the first study to my knowledge of the volatility of humiclike substances (HULIS) in atmospheric aerosols. The results ultimately link HULIS, which has been observed ubiquitously in atmospheric aerosols using filter collection and extraction, with low and extremely low volatility organic material (ELVOC), which has been observed to be similarly common using AMS and thermal denuder-type techniques. The authors also demonstrate that interactions between HULIS and inorganic salts such as sulfate can greatly decrease the already low volatility of the HULIS. This is a very significant contribution to the field, and should be published after a few issues are addressed.

- Another reviewer commented on the relatively few filter samples that were used in this study. Can the authors make an argument to justify this, for example, were the properties of the HULIS on these filters representative of other samples taken at the same location?

Response: Thanks for the comment and suggestion.

Please refer to the response of comment A of referee 3. We actually analyzed 8 HULIS samples, which were collected during both winter and summer. The volatility of all these 8 samples behaved in quite a similar way. We thus selected 4 samples (the PM concentrations of 2 of them were high, and the other 2 were low) to make the arguments clearer.

- My main concern is the extensive chemical processing of the HULIS during isolation before analysis. Is there a way for us to know how this may have impacted the volatility or other properties of the material as compared to the real state in ambient aerosols? A discussion of this point in the manuscript is needed.

Response: Thanks for the comment.

We agree the isolation processes would influence the properties of HULIS as compared to those in real ambient aerosols, especially when inorganic ions were mostly removed. In this work, the sampling site was in Yangtze River Delta, the aerosol of which was dominated by inorganic salts, especially ammonium sulfate which accounted for about 30%

of $PM_{2.5}$ (Xie et al., 2015). This was one of the reason to investigate the possible interaction between ammonium sulfate and HULIS in the manuscript. We will add some discussion on this into the revised manuscript.

What we want to emphasize here is that the volatility (as well as some other physical properties like hygroscopicity) is an overall property/nature of an aerosol that is related not only to the volatility of each individual compounds but also to interactions between these compounds. In case of thousands of compounds in a real atmospheric aerosol, its volatility, especially for organic aerosol, behaves in a very complicated way. Currently, volatility studies on OA have mostly focused on laboratory-generated organic particles or ambient particles. Laboratory-generated organic particles are very far from the real ambient particles, whereas ambient particles are too complex to be understood. Therefore, as we stated in the introduction, one possible way is to isolate some classes of organic compounds of the aerosol and analyze their volatility separately. Here, in this work, the volatility analysis of extracted HULIS from real ambient aerosol was one of such attempts.

- Related to my last point, since the HULIS extraction process removes inorganic ions from the sample, are we to understand that the samples in which salts have been re-introduced are more representative of the true volatility of HULIS in atmospheric aerosols? If so, this should be emphasized.

Response: Thanks for the comment.

We agree with referee's viewpoint and will add some discussion into the revised manuscript.

- Some language editing is necessary in places, for example, lines 42-43

Response: Thanks. We will re-edit the language in the revised manuscript.