

General Comments: This work is very meaningful and helpful to understand the formation of haze day. Adding a mechanism in model would improve the performance of model.

Response: We thank the reviewer for the kind comments.

1. The format of the citation should be unified. For example, in page 16734, line 10, Y. Wang et al., 2006 should be Wang et al., 2006.

Response: Corrected.

2. Providing the concentration of gas pollutants in haze episode would be helpful to understand the formation of haze day.

Response: Accepted. We have presented the observed SO₂ and NO₂ concentrations at the THU site in the revised manuscript.

3. Please provide more information about the uptake coefficient γ , which was adopted in this MS.

Response: In this work, we first took the uptake coefficients from reactions on dust particles and conducted several sensitivity runs by adjusting the uptake coefficients with successive approximation approach. We finally choose the value that can best match observations. We have clarified this in the revised manuscript and added a summary table of adopted γ in the supplementary information.