Responses to the editor comments on

"Sources and processes of iron aerosols in a megacity of Eastern China" by Zhu et al.

The authors would like to thank you for the good suggestions and for giving us the chance to further improve our manuscript! We have carefully considered your comments and revised the manuscript accordingly. Below, we provide responses to the comments in blue, with changes made in the manuscript highlighted in red.

Responses to Editor comments to the authors:

Thank you for the revised manuscript. We think the paper is suitable for publication if you can address this one minor comment regarding the statement that there are no data in the literature on the solubility of iron associated with PM emitted by metallurgy (lines 242-243). Recently, Mulholland et al. (2021) have reported Fe solubilities for industrial ash from a Fe–Mn alloy metallurgical plant (laboratory dissolution experiments in synthetic cloud water). These authors obtained solubilities reaching 2.5-3.0% at pH 2, after a time contact of 60 minutes (ambient temperature and UV irradiation). It might be relevant to cite these values.

Reference cited: In-cloud processing as a possible source of isotopically light iron from anthropogenic aerosols: new insights from a laboratory study.

D.S. Mulholland, Flament, P., de Jong, J., Mattielli, N., Deboudt, K., Dhont, G. and Bychkov, E. Atmospheric Environment, 2021, 259, 118505 (doi: 10.1016/j.atmosenv.2021.118505)

Response: We have deleted lines 242-245 and added corresponding sentences as follows:

Rathod et al. (2020) suggested that metal smelting is a dominant source of anthropogenic Fe emissions. There is limited data on Fe solubility in particles from metal smelting measured in high purity water (as we did in this paper), but Mulholland et al. (2021) showed that Fe solubility of industrial ash from an Fe-Mn

alloy metallurgical plant is only about 2.8% after 60 minutes at pH = 2 synthetic solutions, suggesting a very low Fe solubility in the particles. Thus, it is unlikely that primary emissions of dissolved Fe from industrial emissions 2 (factor 6) can explain its large contribution to dissolved Fe.

(Page 8, Line 237-242)

We also added corresponding reference in the manuscript as follows:

Mulholland, D. S., Flament, P., de Jong, J., Mattielli, N., Deboudt, K., Dhont, G., and Bychkov, E.: In-cloud processing as a possible source of isotopically light iron from anthropogenic aerosols: New insights from a laboratory study, Atmos. Environ., 259, 118505, https://doi.org/10.1016/j.atmosenv.2021.118505, 2021.

(Page 14, Line 429-431)