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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Enhanced heterogeneous uptake of sulfur dioxide on mineral particles through modification of iron speciation during simulated cloud processing" *by* Zhenzhen Wang et al.

Anonymous Referee #2

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General comments

The authors investigated heterogeneous uptake of sulfur dioxide on iron-containing mineral particles. They found enhanced heterogeneous uptake of sulfur dioxide on the mineral particles through modification of iron speciation. The results shown in this paper are very interesting. This study may provide additional pathway to promote the formation of sulfate in iron-containing aerosols. The manuscript is worthy of publication for ACP after some improvements to the readability.

Specific comments

p.4, l.90: The reference of Ito et al. (2019) should be moved to previous sentence after Luo et al. (2008).

p.9, l.205: The formula of geometric area should be corrected.

Table 1: The BET specific surface area is shown in Table S1. The unit and values of the total surface area should be corrected.

p.16, l.373 and Figure 3: Is the trend for ATD statistically significant? Please show the statistics.

Please discuss the results in subsection 3.2 with those in subsection 3.6 as is described in p.21, l.501. Subsection 3.2 may be moved at the end of section 3.

Subsection 3.4 may be combined with subsection 3.1.

p.18, l.430: This has been already suggested by previous studies. Please cite references and rephrase the sentence. Subsection 3.5 may be moved to supplementary materials or before subsection 3.2.

p.20, l.490: This has been already suggested by previous studies. Please cite references and rephrase the sentence. Subsection 3.6 may be moved to supplementary materials or before subsection 3.2.

p.22, l.531: How did you know the particles were coated by reactive Fe? Please specify the relationship between the higher hygroscopicity and reactive Fe coating. Please show this evidence or rephrase the sentence.

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