<u>General comments</u>

1) I am not in favor of capitalizing Secondary Sulfate and Dust aerosol. These are not fixed terms or names and thus should be written in lower case letters.

2) Figure captions: (i) Please make one figure caption per figure, even if the figures include multiple panels (a, b, c etc), instead of having a caption under each panel.
(ii) if there is only one panel (e.g. Figure 8), there is no need to have a description including (a).
(iii) please improve all figure captions such that they describe what is shown and can be understood without having to read the full manuscript text (e.g. Figure 8 is much too brief)
(iv) Make sure that all figures are accessible for readers with vision deficiencies; check them with COBLIS
https://www.color-blindness.com/coblis-color-blindness-simulator/
Rainbow scale color scheme should be avoided to have unambiguous contrasts. Consider using different symbols if possible, e.g. in Figure 9.

3) Please provide a data availability statement according to the journal requirements
https://www.atmospheric-chemistry-and-physics.net/policies/data_policy.html#data_availability

<u>Specific comments</u>

l. 27: The sentence 'This work is the follow up of the article by Almeida et al.(2020).' seems out of place here and can be deleted. It may be better placed in the next sentence, e.g. by replacing 'in the aforementioned publication' by 'as identified by Almeida et al (2020)'.

l. 71: Please add a reference to EN12341

l. 73: Please add a reference to EPA PMF5.0

l. 74-76: Some text seems redundant here stating that only 50 samples were available for the six cities.

l. 92: what does the '(sensitivity)' here refer to? Can the word be simply deleted?

l. 101: do you mean 'included in the model'?

l. 125: Sometimes, you use 'we', sometimes 'the authors'... Using 'we' is more common and should be used for consistency (or replaced by passive voice).

l. 172: Please a reference for the report.

l. 176: 'Smaller differences...' sounds odd after the preceding text of '0 differences' (a difference < 0?). Please clarify.

l. 213: do you mean 'multiplied with'?

l. 224: replace 'that' by 'for which'