

1.	The paper has been improved substantially. I have some comments for a clarification of my concern.	Thank you for reconsideration of our manuscript. We have carefully revised the manuscript with full consideration of the comments and suggestions provided. Please find the detailed responses below.
2.	1.26, 1.320, 1.342: The sentences associated with the enrichment factor of Fe should be revised, according to 1.350.	<p>After careful considerations by all the co-authors, we would like to leave these sentences as they were at this time, for the detailed reasons as described below.</p> <p>L26: As for the abstract, we think it would be good if emission sources of the Fe emissions (mineral or anthropogenic) in the analyzed aerosol are clear. Therefore, there is no need to talk about Fe of anthropogenic origin, which did not have a strong influence on our samples.</p> <p>L320: We mentioned in section 3.1 that Fe in TSP samples was derived from mineral dust due to the unity of EF. However, it is within a range of regular usage of EFs to infer that Fe in aerosol particles is derived from mineral dust when the EF of Fe is 1. Since about 80% of Fe in TSP was in coarse fraction with a minor contribution of anthropogenic Fe, Fe in TSP was derived from mineral dust. Furthermore, we mentioned the correlation between $Fe_{sol}\%$ and EF of Pb in section 3.2. Therefore, we are puzzled by the mention of anthropogenic Fe in section 3.1.</p> <p>L342: The sentence mentions anthropogenic Fe oxides with minor coexistence elements (expected $EF > 1$) rather than coal fly ash. Therefore, we do not revise the sentence.</p>
3.	1.334: Please correct to $PM_{1.3}$.	Thank you for pointing this out. We have corrected it.
4.	1.360: The good correlations of $nss-SO_4^{2-}$ with $Fe_{sol}\%$ and EF of Pb could be explained by the influences from anthropogenic sources, according to 1.348. Excluding the influence of $nss-SO_4^{2-}$ could mean that the anthropogenic factor is excluded. Thus, the residue could represent something other than the anthropogenic factor. Please justify the association of the residue with the emission from coal combustion.	<p>As you point out, discussion about spurious correlations is likely suspicious. We have improved the sentences and removed the Fig. 5f (a scatter plot of residues). In the revised version, $nss-SO_4^{2-}$ was treated as a mediator variance rather than a conjunction factor (details are described in L371-377). Revised text as it appears in the text are described below:</p> <p>L.353-361: Moreover, L-Fe was extracted with MQ water in this study (weakly acidic to neutral conditions), but Fe in the coal fly ash is hardly soluble under these conditions ($Fe_{sol}\% < 0.2\%$, Desboefus et al., 2005; Oakes et al., 2012). Furthermore, all of the Fe in coal fly ash is not dissolved in acidic solutions ($Fe_{sol}\%$: $\sim 70\%$ at pH 1.0, Chen and Grassian, 2013; Baldo et al., 2022). Therefore, if coal fly ash is the dominant L-Fe source, the EF of Co in the aerosol</p>

		<p>should be higher than 3.0. However, the EFs of Co in the PM_{1.3} samples were approximately 1.0 (Fig. S2). These results indicated that Fe in size-fractionated aerosol particles were mainly derived from mineral dust rather than coal fly ash and anthropogenic Fe oxides. However, Fe_{sol}% in non-aged mineral dust is usually less than 1.0% in weakly acidic and neutral solutions. Therefore, high Fe_{sol}% in PM_{1.3} were caused by atmospheric processes of mineral dust during the transport.</p> <p>L.372-378: It should be noted that the correlation between Fe_{sol}% and EF of Pb was caused by a high correlation between nss-SO₄²⁻ and EF of Pb (Fig. 5e). Considering the causal relationship between Fe_{sol}% and EF of Pb, it is difficult to believe that Fe_{sol}% increases with increasing emissions of coal fly ash (increasing EF of Pb) because Fe in coal fly ash is insoluble unless the fly ash undergoes acidification (Desboefus et al., 2005; Oakes et al., 2012). Therefore, it seems that coal-derived SO₂ or H₂SO₄ emitted with Pb by coal combustion solubilizes Fe, resulting in the correlation between Fe_{sol}% and EF of Pb that may have occurred with nss-SO₄²⁻ as a mediator variance.</p>
5.	<p>L.376: EF of Co for S6-CPO is about 40 (Fig. S2). Thus, S6-CPO could be influenced by anthropogenic sources. No terrestrial influence from the 10-day backward trajectories cannot deny this.</p>	<p>One reason for the high EF of Co in CPO samples may be contamination during sample processing. We have established an ultra-clean aerosol sampling method, and carefully treat aerosol samples during experiment. Even so, the possibility of contamination cannot be completely excluded. In the case of CPO samples, even a small degree of contamination significantly impacts analytical data due to low metal concentrations. We think that the filter blanks and operating blanks in our method are among the best in the world, but still it is not easy to overcome this problem with the current technology.</p> <p>Indeed, the absence of terrestrial influences cannot rule out anthropogenic influences. In contrast, the terrestrial influences do not guarantee the impact of anthropogenic emissions because the CPO is in the Southern Hemisphere, far from areas of high anthropogenic activity. At this stage, it is not easy to provide any clear answer. As in your comment in Round 1 (comment 2.2), if comparisons between our observations and a previous model study (Hamilton et al., 2019) are allowed, the contribution of anthropogenic FE to the CPO is small</p>

		(~5%, Hamilton et al., 2019). Therefore, the anthropogenic contribution cannot be emphasized in this region.
6.	1.515: Please correct to under.	Thank you for pointing this out. We have corrected it.