

We thank the Reviewer for their time in providing feedback on our revised manuscript. We have addressed their remaining comment below, where our responses are indicated in **blue** and changes to the manuscript in **bold**.

Reviewer 2

The authors have carefully addressed the previous comments. The paper is much improved and can be accepted after addressing the following comments:

They authors added test with filters to remove chloride containing particles, which can lead to increasing signals of the HCl instrument. However, many Cl-containing gaseous species are semi-volatile, and HCl itself is also semi-volatile. How to rule out the effect of artifacts lead by the filter?

We agree with the Reviewer that use of a filter could lead to bias in the measurement. We have added text to the manuscript in two sections to address this.

Section 3.2

“Thus, to capture only gaseous TCl_g from samples that may contain particulate chloride, a particulate filter should be used. Use of a filter could introduce blow on (i.e., partitioning of semi-volatile species) and/or blow off (i.e., processing of particulate chloride) artifacts. We have previously shown that HCl—likely to be the most surface-active component of TCl_g —is not greatly impacted by the presence of filters (Furlani et al., 2021), indicating blow on effects are likely minimal. However, the extent to which blow on effects should be considered will depend on the composition of the TCl_g mixture and the temperature. Blow off effects will depend on ambient particulate chloride levels and can be mitigated by regularly changing the filter to prevent significant particulate chloride accumulation.”

Section 3.4

“The filter present in the inlet was unlikely to have led to artifacts in this measurement. Particulate chloride is negligible in continental summertime environments (Kolesar et al., 2018), indicating blow off artifacts would be minimal. Most ambient TCl_g measurements were above the expected mixing ratio of LLCl_g . It is possible that semi-volatile chlorinated species could have partitioned to the filter, acting as a blow on effect, and leading to an underestimate of TCl_g . However, the warm temperatures during sampling (13 to 31 °C) and high observed TCl_g levels suggest this was not a large effect.”

Other changes

We have added reference to the datasets that can now be found in the Federated Research Data Repository (Furlani et al., 2022). This has been referenced in the main text and in the Data Availability section.

References

Furlani, T., Ye, R., Stewart, J., Crilley, L., Edwards, P., Kahan, T., and Young, C.: Outdoor and indoor gaseous total chlorine measurement in Toronto Canada [data set], Federated Research Data Repository, <https://doi.org/10.20383/103.0649>, 2022.

Kolesar, K. R., Mattson, C. N., Peterson, P. K., May, N. W., Prendergast, R. K., and Pratt, K. A.: Increases in wintertime PM_{2.5} sodium and chloride linked to snowfall and road salt application, *Atmos Environ*, 177, 195–202, <https://doi.org/10.1016/j.atmosenv.2018.01.008>, 2018.