

Gaseous hydrochloric and hydrobromic acid play important roles in tropospheric physicochemical processes, however, the atmospheric gaseous HCl and HBr in urban environments, are much less studied. This manuscript focused on the concurrent measurement of gaseous HCl and HBr by a CI-APi-LTOF mass spectrometer in urban Beijing, China, which is rarely reported before. Strong gaseous HCl and HBr were observed in Beijing where marine sources only have limited influence. Anthropogenic emissions seem to be a more important factor. This study estimates the production of atomic Cl and Br by the reactions of HCl and HBr with OH, which further contribute to atmospheric oxidation capacity. It provides a new insight of halogen chemistry in Chinese megacities and fits the scope and the interest of the journal of ACP. It is well organized and professionally written. Therefore, I recommend this manuscript for publication after minor revisions.

Some minor comments:

1. Line 5: In the authors list, It seems to be press error that some affiliations are marked with superscript and the rest ones are with subscript.
2. Line 115: Besides HNO₃, some other strong acids such as gaseous H₂SO₄ can also displace HX from sea-salt particles (Thornton et al., 2010). The authors should also add that information.
3. Line 174 delete the words of “atmospheric Br”.
4. Line 178 “Crisp et al. (Crisp et al., 2014) summarized that...” should be revised to “Crisp et al. summarized that...”
5. To better present the results, I recommend the authors to improve the quality of the figures. Take Figure 6 for example, to better present the comparison, panel C can be divided into two sub-panels. The sizes of the panels of Figure 4, Figure S9 and S10 should be the same.
6. In the manuscript, to compare the concentrations of HCl and HBr between the Beijing, China in this study and other locations from previous ones (Lee et al., 2018; Simpson et al., 2015), it is better to also include the unit of mixing ratios (i.e., ppt) beside number concentrations (# cm⁻³) in the measurement.
7. How do HCl and HBr behave on clean days and polluted days? are their concentrations higher during polluted days?
8. The title of “3.3 halogens atom production” should be “3.3 halogens’ atom productions” or “3.3 halogen-atom productions”. Besides, this part is interesting and important. Can

the authors expend this part a bit to better elucidate the potential applications of the results from the measurement?

9. In SI, a good correlation was observed between measured J_{NO_2} and modelled J_{NO_2} (Figure S11). Please add the brief description of the model that used.

References:

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- Simpson, W. R., Brown, S. S., Saiz-Lopez, A., Thornton, J. A., and Glasow, R.: Tropospheric halogen chemistry: sources, cycling, and impacts, *Chem Rev*, 115, 4035-4062, 10.1021/cr5006638, 2015.
- Thornton, J. A., Kercher, J. P., Riedel, T. P., Wagner, N. L., Cozic, J., Holloway, J. S., Dube, W. P., Wolfe, G. M., Quinn, P. K., Middlebrook, A. M., Alexander, B., and Brown, S. S.: A large atomic chlorine source inferred from mid-continental reactive nitrogen chemistry, *Nature*, 464, 271-274, 2010.