

**General comment:** The authors provide an interesting box-model study showing the impacts of extended Cl chemistry on two distinct urban environments. While the majority of the reviewers' comments have been addressed in the revised versions, I have a few remaining questions, and also some minor typographical errors (listed in the 'private note' to authors) that should be addressed. I noted a few points in going through the response to reviewers and the manuscript that could be improved.

**Response:** We are grateful for a careful evaluation of the revised manuscript and valuable comments. Our responses are given below in blue-color fonts and corresponding changes in the manuscript are highlighted in red-color.

**Comment 1:** Reviewer 2 noted the possibility of the formation of organohalogens. I see that Cl+isoprene (which is known to make organohalogens) is included in the model, but (presumably for simplicity?) the chemistry in the model mimics the OH reaction. Maybe a brief statement could be made along these lines?

**Response:** Yes, a simple mechanism mimicking the OH + isoprene has been included for Cl + isoprene reaction. Developing a kinetic model for the isoprene oxidation forming organohalogens could be another major project worth addressing in a future study. As suggested, we have clarified this aspect in the revised manuscript, as follows:

**Lines 122-124:** “The reaction of Cl atoms with isoprene proceeds mainly via addition, and it produces chlorine-containing organics (Ragains and Finlayson-Pitts, 1997; Fan and Zhang, 2004). However, here we have simplified the mechanism by not considering the fate of organohalogens.”

2. Line 286, perhaps elsewhere. The fact that Cl-reactivity is high compared to OH reactivity does not necessarily mean that Cl contributes significantly to oxidizing capacity (there need of course to be Cl-atoms present). Please clarify.

**Response:** We agree. Apart from higher Cl reactivity compared to OH, abundance of Cl-atoms should be significant to influence the oxidation capacity. The discussion has been revised suitably, as follows:

**Lines 297-298:** Accordingly, the magnitude of AOC depends upon the concentration and reactivity of Cl.

**Lines 301-303:** Besides the abundance of Cl, higher reactivity enhances the contribution of Cl in AOC, which is further substantiated by the ratio of Cl reactivity to OH reactivity (Fig. 5b).

**Lines 363-364:** However, Cl to OH reactivity ratio ( $\approx 270$ ) is pronounced in Leicester coinciding with higher contribution of Cl in AOC.

3. Please add anything further to the specific comment #6 of R2 regarding the ClNO<sub>2</sub> uptake coefficient, if possible.

**Response:** We performed a sensitivity simulation with ClNO<sub>2</sub> uptake coefficient of 1E-5 and compared the loss rate of ClNO<sub>2</sub> with Cl<sup>-</sup> in this simulation with NEW simulation over Delhi.

**Accordingly, the following discussion has been added in the revised manuscript to mention the role of ClNO<sub>2</sub> uptake coefficient.**

**Lines 256-259: We are using ClNO<sub>2</sub> uptake coefficient,  $\gamma = 9E-3$  from Fickert et al. (1998) in the simulation. Sensitivity simulation with  $\gamma = 1E-5$  (Haskins et al., 2019) results in considerably slower (by a factor of  $\approx 270$  and  $\approx 17$ , near sunrise and during mid-day, respectively) loss rate of ClNO<sub>2</sub> with Cl<sup>-</sup> than in the NEW simulation over Delhi.**

**Minor 'typos':** Please replace the current text with that shown below:

**Response: All the typos pointed out by the editor, listed below, have been corrected in the revised manuscript.**

Line 14 (and elsewhere): 'near sunrise'.

Line 17: the atmosphere and radical cycling..."

Line 32: 'associated mechanisms'

Line 33: delete 'however'

Line 45: "A few recent studies..."

Line 115: 'The heterogeneous chemistry just discussed is implemented..."

Line 182: "gets removed rapidly during..."

Line 228-9: "due to Cl chemistry, further measurements..."

Line 232: "left-upper panel (a)"

Line 236: "to the morning peak, which have ..."

Line 252: its (not it's)

Line 369: "to better quantification of the importance..."