

## A point-to-point response and relevant changes made in the revised manuscript

*The authors are to be congratulated on getting the manuscript ready for publication in just over 6 months from the end of their field campaign - a fine achievement. They are also to be complimented on the good English in their manuscript - the corrections in my Editorial Comments below are mostly trivial and comparatively unimportant.*

*Unfortunately, I am not a specialist in ionisation for Mass Spectrometry, nor in the details of chromatography, so must take as read the descriptions following lines 194 and 228, and elsewhere in the manuscript. Hopefully, another Referee can approve these statements.*

*The manuscript contains a wealth of new information on iodine compounds in particles, and if the accuracy of the statements about techniques are confirmed, it should definitely be published after taking care of the minor comments below.*

Re:

We thank the referee for his important comments and careful examination of the manuscript. Point-to-point responses are given below. All relevant changes made in the revised manuscript are highlighted in yellow color.

### **Minor Comments:**

1. Lines 43 & 44 read as though the iodine compounds are all that is necessary, despite “contribute to”. You should perhaps insert the sentiment that sulphates are usually involved.

Re: we rephrase to

“the subsequent growth of these iodine particles in the presence of other condensable vapors contribute to cloud condensation nuclei (CCN)”

2. Lines 52 and 53 should perhaps include that iodate is assumed to dominate because in water without biological enhancement the equilibrium ratio of iodate to iodide is about 10:1.

Re: we rephrase to

“The majority of atmospheric models assume that  $\text{IO}_3^-$  would be the only stable and predominant iodine species in aerosols”

3. Line 94 uses the opaque term “cut sizes”. Instead, say if the values given are the lowest, mean or largest size in each range sampled.

Re: we rephrase to “ $d_{50}$  cut-off sizes”, which is the most accurate term for cascade impactors.

4. I seem to recall the suggestion in lines 354 and 355, that sulphur as well as iodine compounds were implicated in particle growth from below 20 nm was made some time ago in papers by John Plane and co-authors. It is probably worth chasing down these earlier references.

Re: in lines 373-375 we add

“This is consistent with previous laboratory observations of efficient uptake of H<sub>2</sub>SO<sub>4</sub> onto humidified iodine oxide particles below 20 nm (Saunders et al. 2010).”

5. Surely, the sentence “During the aging process ... were formed from aqueous phase reactions” (lines 375-357) is speculation, so should contain “we presume” or some such?

Re: thank you for pointing out this. Considering also the comment from Referee #2, in lines 393-396 we change to:

“Upon arrival in the coastal region, the uptake of gaseous HI, HOI or IONO<sub>2</sub> onto these anthropogenic particles and the subsequent aerosol phase reactions between I, H<sub>2</sub>O<sub>2</sub>/O<sub>3</sub>, HOI and aromatic compounds are hypothesized to be the formation mechanism of aromatic iodine compounds.”

6. Quoting the various fractions and errors to a decimal percentage point, in lines 401 to 406, is out of place when the errors are several percent. This is also true of other lines in the manuscript, e.g. line 412, Table 2.

Re:

We change all numbers to only two significant digits in lines 420-431 and table 2.

7. It may be well-known to Chinese researchers that China produces more than 90% of the seaweed of the world (line 421), but this astounding proportion, presumably of seaweed taken from the sea not all seaweed, is not at all well-known in the west. Some references should be given, and perhaps a small amount of cultural background as it is a very large proportion.

Re:

The previous number 90% was from China’s local authority of algae industry. Now we cite a more reliable number 58% from academic data source in line 440.

“China produced 58% of global cultivated seaweed production (11 million tons in 2010, Nayar and Bott, 2014).”

Nayar S. and Bott K.: Current status of global cultivated seaweed production and markets, World Aquaculture 45(2):32-37, 2014

### **Editorial Comments:**

Line 21- presumably you mean “of iodine species in aerosols”.

Line 29 - should be “human beings”.

Line 68- insert “an” before “individual”.

Line 75 - replace “in the places out of coastal” by “other than at coastal”, assuming this

*is what you meant.*

*Line 75 - replace “west” by “western”.*

*Line 87 and throughout - insert a space before the number and the unit, here before “m”.*

*Line 126 and later - replace “n-m stages” by “stages n-m”.*

*Line 133 - replace “One-fourth or half of filter” by “A quarter or half a filter”.*

*Line 144 - replace “ kv “ by “ kV “.*

*Line 146 - replace “ion” by “ions”.*

*Line 149 - insert “was” before “scanned”.*

*Line 150 - replace “would” by “will”.*

*Line 166 - replace “midnight” by “the middle of the night”, if that is what you meant.*

*Line 167 - replace “originated” by “originating”.*

*Line 171 - replace “last” by “lasted”.*

*Line 243 - insert “to” before “stand”.*

*Line 273 - insert “The” before “Other”.*

*Line 310 - insert “a” after “as”.*

*Line 318 - replace “was” by “were”.*

*Line 324 - insert “a” after “still”.*

*Line 326 - insert “a” after “to”.*

*Line 327 - use “concentrations”, plural.*

*Line 347 - use “events”, plural.*

*Line 370 - use “areas”, plural.*

*Line 371 - insert “to be” after “unlikely”.*

*Line 384 - either “more” or “future” but not both.*

*Line 397 - insert “A” before “negligible”.*

*Line 411 - use “processes” plural; insert “the” before “most”.*

*Figure 1 - is almost illegible, please enhance the contrast and make it larger.*

*Figure 9 - is too small to read the numbers.*

**Re:**

We thank the referee for his careful examination throughout the manuscript. All grammar mistakes are corrected accordingly. The contrast and size of Figure 1 are enhanced. The number size in Figure 9 is enhanced.