

Interactive comment on “Iodine speciation and size distribution in ambient aerosols at a coastal new particle formation hotspot of China” by Huan Yu et al.

Anonymous Referee #3

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The paper by Yu et al. is an important study in quantifying iodine species in atmospheric aerosols. Given their low concentrations, but dominant role in new particle formation, studies like this offer significant advancement in understanding processes where direct measurement of iodine species is always very challenging or not yet developed. The study is well written and should be accepted after addressing mostly minor (but often important) comments.

Comments

Line 17. quadrupole (several cases thereafter).

Line 25. The sentence is rather pointless in the abstract as it should summarize significant findings, not just "shedding light".

Line 30. O₃ is largely depleted due to mainstream NO_x chemistry, especially taking into account miniscule amount of iodine compounds.

Line 57. knowledge gap instead of unknown, because we already know quite a bit.

Line 71. techniques, not experiments.

Line 116. What fraction of 72h sampling period were actual NPF events? Could be easily estimated from concurrent SMPS/NAIS measurements. It is an important estimate considering different iodine sources in coastal/inland environment.

Line 177. There is a question to what extent those intense I-NPF events were driven by ordinary coastal algae induced emissions as compared to dried farmed algae. Without an estimate it is little reason to compare with natural environment like Mace Head which is not even located at a hot spot.

Line 189. It is important to consider not only nucleation relevant gaseous iodine species, but also condensation sink which limits the production of new particles.

Line 209. Quadrupole

Line 238. "from" typed twice.

Line 299. mode not model.

Line 303. PM₁ or PM_{0.5} would be adequate substitutes too were size-segregated samples not available.

Line 323. limitations not weaknesses.

Line 324. ...there still a possibility..

Line 327. ...the most serious. Also wasn't sulphate and nitrate high in this study as considered?

Line 330. two significant digits are sufficient, unless better than 1% precision which is impossible in regression analysis.

Line 336. over the entire period of 3 sampling days.

Line 337. iodine concentrations were certainly higher and it can be estimated by the duration of NPF events and iodine concentrations outside of NPF events.

Line 341. uncertainties of semi-quantification are partially related to bulk mass matrix interferences, so distributions are not highly accurate.

Line 349. high iodide concentrations

Line 351. most likely originating from the partitioning

Line 355. The role of sulfuric acid in new particle growth has long been established.

Line 389. ...the rest of the data

Line 393. please note the numbers claimed for comparison.

Line 413. ...counted towards organic iodine...

Line 420. coastal locations of western Europe...

Line 423. This claim is overblown out of proportions, because the impact of algal farms would be limited by a small physical footprint of the entire coastline area.

Figure 7. R^2 is not a correlation coefficient, but variance which is interpreted as the percentage of variance between two variable to the total variance.

Figure 8. "continental" misspell.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-1353>, 2019.