

Interactive comment on “Iodine speciation in rain, snow and aerosols and possible transfer of organically bound iodine species from aerosol to droplet phases” by B. S. Gilfedder et al.

Anonymous Referee #2

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General comments:

I think this is a strong contribution to the interesting subject of iodine chemistry in marine aerosols. The authors have made a unique set of measurements, with the clear implication of the importance of organoiodine to the mass balance of aerosol iodine. Their results (along with Baker's earlier work) challenge some long-held thoughts about the dominance of inorganic iodine in aerosols. I think the authors have done a nice job of placing this study into the context of prior research, and in pointing out directions for future research. I recommend the paper for publication, with consideration of the comments below.

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Specific comments:

p7979 line 10 Intro - I think the comment in the introduction about global fluxes of iodine particles altering the energy balance is overstated and should be deleted. This is a coastal phenomenon as far as we know, and there is no way iodine-based particulates are of significance in a global direct radiative sense. The rest of the introduction is very well done.

7985 - how much confidence do the authors have on the assignment of the 4 min 40 sec peak to iodoacetic acid? Although it may well be correct, a peak match under a single set of IC conditions is not a very solid identification, particularly for organic compounds which may interact with an ion chromatographic column via several different mechanisms. The fact that Dionex developed these columns for anions does not necessarily mean that is how these molecules are interacting with it. If there is no additional evidence, then this assignment should probably be considered provisional.

Technical corrections:

p7978 Abstract, l1 - change "theoretically" to "thermodynamically"

p7978 Abstract, l10 - change "while" to "and"

7980 l12 - should read "hampered by the lack of reliable methods for speciation ..."

7990 l9 - not clear what is meant by "non-linear reaction" - From the discussion following this statement it appears that what is meant is "the rate of reaction between iodine and aerosol organics may vary as the organics age"? This should be reworded for clarity.

7990 l28 - The fact that diurnal variations were not observed should be termed "unfortunate", unless one is personally advocating for one explanation over another. Perhaps it could be considered unfortunate that the study was conducted on cloudy days (although I suppose that is not unexpected at Mace Head).

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