

## ***Interactive comment on “Detection and quantification of gas-phase oxidized mercury compounds by GC/MS” by C. P. Jones et al.***

### **Anonymous Referee #1**

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Detection and quantification of gas-phase oxidized mercury compounds by GC/MS

**Summary:** This paper describes the development of an instrument to hopefully identify and measure atmospheric oxidized mercury compounds. Currently there are no measurement techniques that speciate and quantify oxidized mercury. Much is unknown about the chemical composition of oxidized mercury and knowing the chemical form of mercury is critically important because mercury is a toxic pollutant and the forms that it takes determine its interaction with the environment. This paper gives a nice introduction to the subject for those not familiar with it. It is fairly well organized but the Materials and Methods section(s) and the Results and Discussion section(s) are organized in a similar way and at times it is a little confusing as to what material should be put in the Methods section and what should be put in the Results section. I understand why the authors did this and it works mostly but there are some places for improvement

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in the presentation – I try to point out a few of these below.

This is a good contribution to the literature as it points out a possible approach to detecting the oxidized mercury species and also shows how difficult it appears to be.

The analytical methodology is based on good principles and understanding of the scope of the challenge. The wetted parts of the system were kept at least at 160 C which is a challenge in itself. I did not understand the preparation steps for the PDMS sorption tubes. What was trying to be accomplished by the acid was etc.?

In section 3.1 line 27 – 35: this is a very strange result and although the authors acknowledge it as such it really doesn't make much sense. Was the percent HgII recovery always increased from 83 and 98% or was this a one time test? If it represents multiple tests there should be some variability reported in the results.

Page 7 line 12: change to “we constructed the plumbing for our GC/MS system. . .

Page 7 line 20: Put the first two sentences in the Methods section (2.3) along with Table 2.

Page 7 line 33: Already stated the three columns that were used. Suggest to re-write that first sentence: Of the three columns we tested for transmission of HgBr<sub>2</sub>, we only observed peaks with. . .

Page 11 line 6: “Further improvements to the MS. . .” - what improvements have already been made? – this suggests there were some – and by whom were the improvements made?

Page 11 line 11: It strikes me that perhaps the authors should try this before publishing this paper.

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