

## ***Interactive comment on “Atmospheric methanol measurement using selective catalytic methanol to formaldehyde conversion” by S. J. Solomon et al.***

### **Anonymous Referee #2**

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This paper proposes a novel method for detecting and determining quantitatively traces of methanol in air (ppb level). The main goals are (i) a method selective to methanol, (ii) a portable and inexpensive system. Overall, this is a very good paper. The new method is clearly explained and the paper is clearly structured.

I would like to make some comments on specific issues. 1) Catalyst: Since the goal of the research is not the development of a catalyst, the authors may consider to use a commercial oxidation catalyst instead of manufacturing their own. Commercial catalysts are available in reproducible batches, while good reproducibility is difficult to

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achieve among different research laboratories.

2) Section 3.1.1., conversion efficiency. This quantity should be defined as the reverse of the definition in the text at lines 6-8, i.e. moles of HCHO/moles MeOH. Otherwise conversion efficiencies  $> 1$  are obtained.

3) Section 3.1.1., Figures 2 & 3: In the text, the term "conversion efficiency" is used but in these Figures the production efficiency of HCHO is plotted (actually it is the reverse, see comment no. 2). In chemical terms, this is the formaldehyde yield. I suggest to clearly define and separate "methanol conversion efficiency" and "formaldehyde yield" in the text and to make the terms consistent with Figures 2 & 3.

4) Section 3.1.3. The explanation is not clear why there is any methanol conversion at all when no oxygen is present. Methanol may decompose thermally to HCHO and H<sub>2</sub>, or oxygen could stem from the oxide catalyst itself. Were these possibilities examined?

5) Catalyst stability: I recommend testing H<sub>2</sub>S, SO<sub>2</sub> and NH<sub>3</sub> as potential poisons present in air.

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