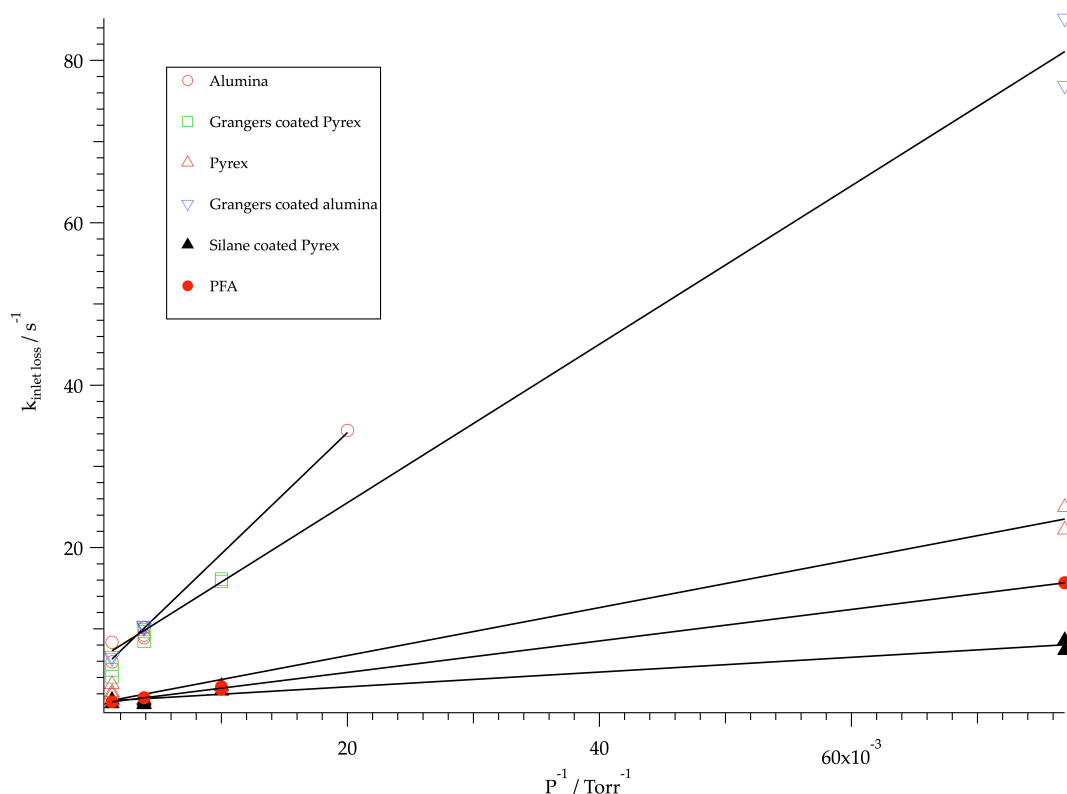
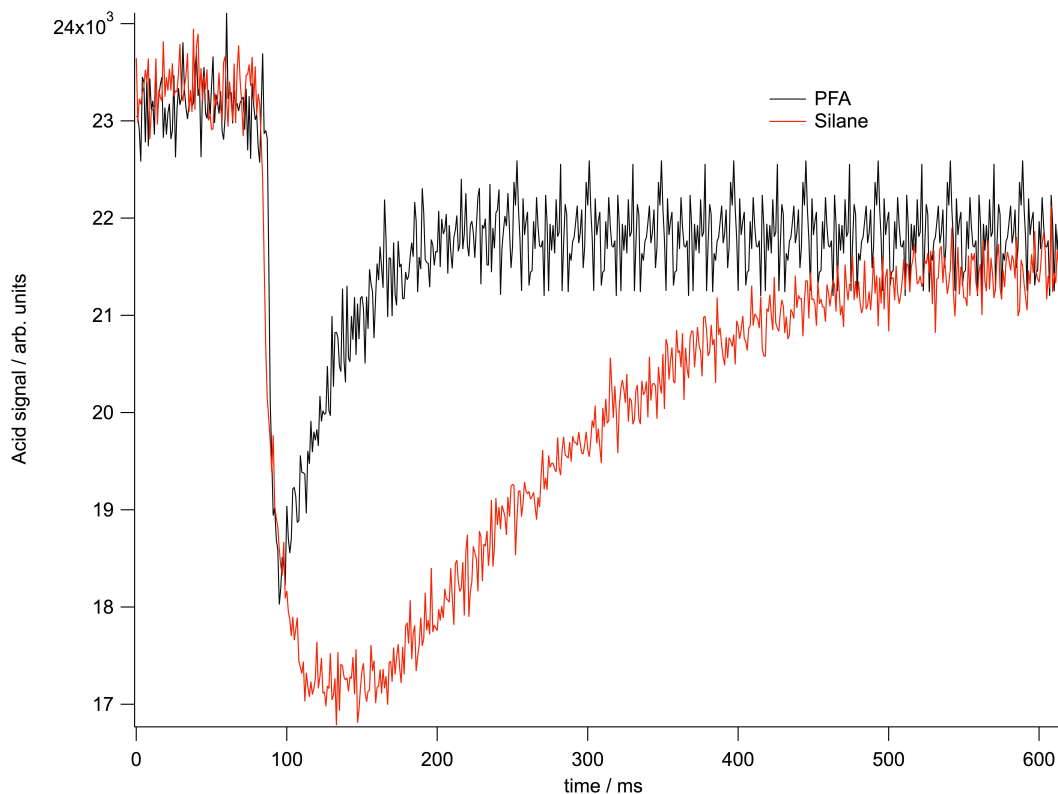


Muller is correct that we assume that HMHP will form HCO(O)H instantaneously on the timescale of our experiments. As pointed out the wall loss that we observe is small for both acids and ozone. It is unclear as to why HMHP would not have a similarly small wall loss. Furthermore, if the HMHP did have a significant decomposition rate in forming HCOOH we would observe a time lag in the HCOOH formation, as pointed out in the manuscript we did not. The residence time along the PFA tube is less than 50ms, so contribution from the sampling regime is thought to be insignificant. We have tested other coatings, using our coated wall flow tube-CIMS system. The results of which are shown below. Pyrex shows a significantly greater wall loss than PFA.

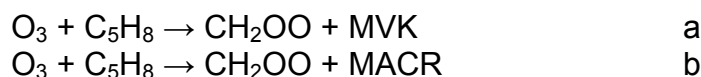


Furthermore, PFA had a better time response than siloxyl coated flow tube, thus PFA gave the best time response, Similar observation have been made by Huey et al., 2000 for the quantification of HNO₃ in the atmosphere.. Below is a sample comparing PFA (black line) to siloxyl coated glass (red line), the time response for siloxyl is worse than that of PFA as shown by the times needed to reach equilibrium signal.



The Formic acid yield was observed by Lee et al., 2006 and was used to scale the emissions from terpenes (some of which clearly do have terminal double bonds). In the paper of Larson et al., 2001 it states that the comparison of the results of the present work to previous studies on the ozone-initiated oxidation of terpenes (e.g., Glasius et al., 2000), show that OH-radical reactions with terpenes form significantly smaller amounts of carboxylic acids than ozonolysis reactions." We were using this as a lower limit. So we feel that our conclusions are still valid. Indeed Glasius et al., typically observe acid yields of 1 – 2 orders of magnitude higher from ozonolysis in comparison to that of OH initiated. Unfortunately there is no experimental data for formic acid yields from terpenes however, we feel that the values used represent a lower limit and thus rather than overestimate the contribution we have underestimated them.

The estimate is indeed high for HCOOH from isoprene. In these model simulations about 10% of isoprene oxidation is via reaction with ozone. Ozonolysis of isoprene will follow the following paths that yield CH₂OO



Hence, the yield assumed for HCOOH (assuming all CH₂OO reacts with H₂O) will be equal to the sum of the yield of MVK and MACR. Various studies have investigated this yield and a value of 0.6 is consistent with most of them. Hence, in this calculation we have assumed a yield of 0.6. Based on Aschmann et al., (1996), CH₂OO yields from ozonolysis of MACR ~ 0.88 and from MVK are ~ 0.95. and in the model, ozonolysis of MACR + MVK ~ 10%.