

Atmos. Meas. Tech. Discuss., referee comment RC1
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Comment on amt-2021-332

Anonymous Referee #2

Referee comment on "A source for the continuous generation of pure and quantifiable HONO mixtures" by Guillermo Villena and Jörg Kleffmann, Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-332-RC1>, 2021

A continuous source for the generation of pure HONO mixtures from the sub-ppb range up to 500 ppb is developed and characterized. Nitrite is almost completely converted into HONO due to the acidic conditions of the aqueous phase ($\text{pH} \approx 2.5$). The source shows a fast time response of ~ 2 min (0-90 %) at higher concentrations and an excellent long-time stability. A general equation based on Henry's law is developed, whereby the HONO concentration of the source can be calculated using measured experimental parameters, i.e. nitrite concentration, liquid flow rates, gas flow rate, pH of the solution and temperature of the stripping coil. For the calculation of the effective Henry's law constant, the acid dissociation equilibrium of HONO/nitrite is used as a variable to adjust the theoretical HONO concentration to the measured values. A standard deviation between all measured and theoretical HONO concentrations of only ± 3.8 % is observed, for the first time, a stable HONO source is developed. I believe this study is of great interest to readers. There are some comments that the authors should consider, then the manuscript can be accepted to publish.

- Lines 161, " the theoretical and not the experimental pH values were used for $\text{pH} < 2$ in Figure 2" Why use theoretical values instead of experimental pH values here?
- Lines 200, in figure 3, HONO should be added an ordinate.
- Lines 271, the English usage in the statement of " A HONO source was developed and characterized, where HONO is produced by the reaction of diluted nitrite and H_2SO_4 solutions in a temperature-controlled stripping coil " is not understandable and the sentence should be rephrased.
- Lines 280, why the time response depending on the HONO concentration levels?
- In the part of 3.2, is it calibrated with Nitrogen (N_2) as the background? What is the gas flow in this part?
- In the part of 3.6, the source was operated at a low liquid pump speed of 10 rpm to get 2s noise is 0.76 %. Can you get the same value at the liquid pump speed of 20 rpm? Or the same value in the next experiment at 10 rpm?