Supplement of

NO$_3$ chemistry of wildfire emissions: a kinetic study of the gas-phase reactions of furans with the NO$_3$ radical

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Table S1 Relative $k(\text{NO}_3)$ rates for each compound relative to each other for each experiment.

| Compound1       | Compound2       | Reference    | $kC1/kR$ | $kC2/kR$ | $kC1/kC2$ | Date     |
|-----------------|-----------------|--------------|----------|----------|-----------|----------|
| furan           | $\alpha$-angelicalactone | $\alpha$-pinene | 0.25     | 0.466    | 0.536     | 04/05/21 |
| furan           | furfural        | cyclohexene  | 2.73     | 0.153    | 17.8      | 07/04/21 |
| furan           | -               | camphene     | 2.39     | -        | -         | 11/05/21 |
| 2-methylfuran   | -               | 2-carene     | 1.30     | -        | -         | 26/03/21 |
| 2-methylfuran   | pyrrole         | 2-carene     | 1.15     | 3.84     | 0.30      | 30/03/21 |
| 2-methylfuran   | -               | $\alpha$-pinene | 3.66     | -        | -         | 05/05/21 |
| 2-methylfuran   | -               | TME          | 0.346    | -        | -         | 07/05/21 |
| 2,5-dimethylfuran | 2-methylfuran | 2-carene     | 5.60     | 1.26     | 4.46      | 01/04/21 |
| 2,5-dimethylfuran | pyrrole       | 2-methylfuran | 4.60     | 3.04     | 1.52      | 02/04/21 |
| 2,5-dimethylfuran | 2-methylfuran | TME          | 2.12     | 0.398    | 5.33      | 19/04/21 |
| furfural        | -               | 1-ol         | 0.367    | -        | -         | 21/04/21 |
| furfural        | -               | camphene     | 0.144    | -        | -         | 12/05/21 |
| $\alpha$-angelicalactone | furan        | cyclohexene  | 5.41     | 2.46     | 2.2       | 08/04/21 |
| pyrrole         | -               | TME          | 1.23     | -        | -         | 06/05/21 |
| pyrrole         | -               | TME          | 1.25     | -        | -         | 08/05/21 |
Figure S1 Concentration-time profiles from experiment with 2-carene, 2,5-dimethylfuran and 2-methylfuran. Further plot details are as for Figure 1 in the main manuscript.

Figure S2 Concentration-time profiles from experiment with 2-methylfuran, 2,5-dimethylfuran, and pyrrole. Further plot details are as for Figure 1 in the main manuscript.

Figure S3 Concentration-time profiles from experiment with α-pinene, and 2-methylfuran. Further plot details are as for Figure 1 in the main manuscript.
Figure S4 Concentration-time profiles from experiment with α-pinene, and 2-methylfuran. Further plot details are as for Figure 1 in the main manuscript.

Figure S5 Concentration-time profiles from experiment with camphene, and furfural. Further plot details are as for Figure 1 in the main manuscript.

Figure S6 Concentration-time profiles from experiment with 2-methylfuran, 2,5-dimethylfuran, and TME (2,3-dimethyl-2-butene). Further plot details are as for Figure 1 in the main manuscript.
Figure S7 Concentration-time profiles from experiment with γ-crotonolactone, and cyclohexane. Further plot details are as for Figure 1 in the main manuscript.
Figure S8 Reference spectrum of furan at a resolution of 0.25 cm\(^{-1}\)

Figure S9 Reference spectrum of 2-methylfuran at a resolution of 0.25 cm\(^{-1}\)
Figure S10 Reference spectrum of 2,5-Dimethylfuran at a resolution of 0.25 cm$^{-1}$

Figure S11 Reference spectrum of furfural at a resolution of 0.25 cm$^{-1}$
**Figure S12** Reference spectrum of $\alpha$-angelicalactone at a resolution of 0.25 cm$^{-1}$

**Figure S13** Reference spectrum of $\gamma$-crotonolactone at a resolution of 0.25 cm$^{-1}$
Figure S14 Reference spectrum of pyrrole at a resolution of 0.25 cm$^{-1}$