

## Reactivity of $\gamma$ -Terpinene with $\text{NO}_3$ radicals: experimental approach for kinetic and mechanistic study.

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Biogenic Volatile Organic Compounds (BVOC) are highly emitted by vegetation and play a key role in atmospheric chemistry. They are very reactive with atmospheric oxidants (OH,  $\text{NO}_3$ , ozone) and significantly contribute to the formation of Secondary Organic Aerosol (SOA) at the global scale [1]. In addition, night-time chemistry initiated by  $\text{NO}_3$  radicals leads to the formation of organic nitrates which behave as reservoirs for reactive nitrogen. However, the reactivity of  $\text{NO}_3$  radical with BVOCs other than isoprene and  $\alpha$ - and  $\beta$ -pinene, remains poorly understood.

Among the BVOCs,  $\gamma$ -Terpinene is one of the most emitted by vegetation[2]. Two kinetic works were previously published on  $\gamma$ -Terpinene [3] [4], but mechanistic has never been studied. Thus, the aim of this work is to study the reactivity of  $\gamma$ -Terpinene with  $\text{NO}_3$  by performing experiments in simulation chambers. Kinetic, mechanism and SOA yield will be investigated. For this purpose, two different simulation chambers have been used:

- First one, consisting of a Pyrex reactor of 1 m<sup>3</sup> [5] coupled to a long path in situ FTIR spectrometer and a Proton Transfer Reaction Time of Flight Mass Spectrometer (PTR-ToF-MS) in  $\text{NO}^+$  mode which was internally developed in LISA, to measure organic nitrates concentration.

- Second one, the CESAM chamber (<http://cesam.cnrs.fr>) [6] is a 4.2 m<sup>3</sup> stainless steel chamber which permits to conduct SOA experiments at different temperature and relative humidity. In situ FTIR and PTR-ToF-MS are used to measure gaseous concentrations, and a SMPS was used to characterize particulate phase.

Kinetic and mechanistic results will be discussed and compared with the literature values.

### References

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