

Experiments and calculations on hydroxyl radical production from peroxy radical reactions

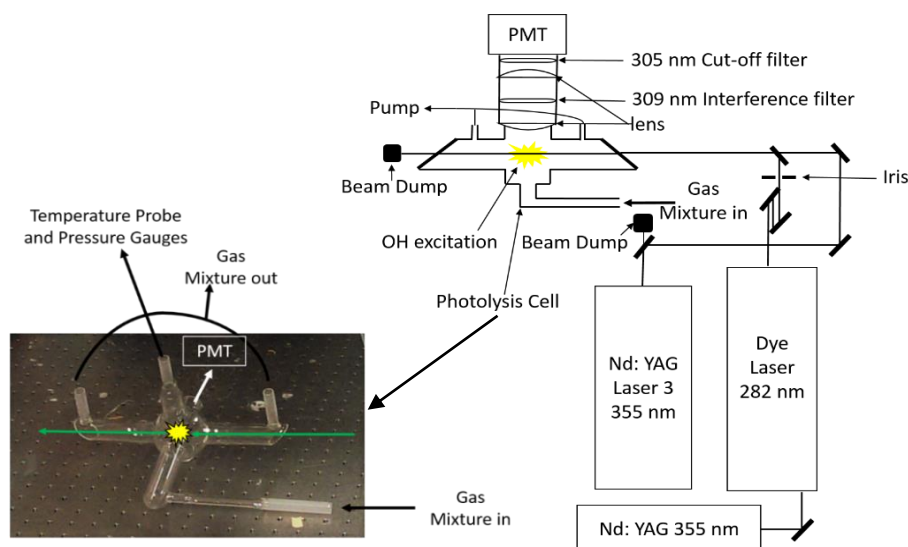
Fiona C. Whiting*, Terry J. Dillon and Derek A. Wann

Dept. of Chemistry, University of York, Heslington, York, UK

* fcw505@york.ac.uk

The hydroxyl radical, OH, is one of the most important radical oxidants in both atmospheric and combustion chemistry.^{1–4} In the troposphere, OH initiates the degradation of a wide variety of volatile organic compounds (VOC), notably methane and isoprene. VOC oxidation leads to the hydroperoxy radical, HO₂, and organic peroxy radicals, RO₂. These RO₂ species are key intermediates since their chemistry controls the relative rates of radical termination and chain-branching processes in both the atmosphere and in “cool flames” such as biofuel engines.^{1–4}

In a new experimental set-up at the University of York, pulsed laser photolysis (PLP) is combined with laser induced fluorescence (LIF), for the detection of OH. Preliminary experiments, using OH from acetaldehyde degradation to calibrate the system, demonstrate that larger (C₄ & C₅) aldehydes do break down to form OH in the gas phase. These experimental results are being supported by quantum chemical calculations.



References

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