

ATHOS OH, HO₂ & H₂O: OH reactivity

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Measurements:

✓ OH and HO₂ by FAGE LIF

 H₂O by LIF quenching

✓ OH reactivity by OH decay in a flow tube

data	interval	LOD	accuracy	coverage	missions
OH	20 s	0.01 pptv	± 32%, 2σ	> 90%	7
HO ₂	1 – 20 s	0.1 pptv	± 32%, 2σ	> 90%	7
H ₂ O	1 – 20s	0.005 ??	± ??%, 2σ	??%	0
OH reactivity	20 s to 3 min	0.3 s ⁻¹	20%, 2σ ± 0.3 s ⁻¹	> 50%	1

Analyses:

✓ comparisons with HOxCIMS

✓ collaborations with LARC, CTM modelers

✓ box modeling using 4 different chemical mechanisms

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- Operational requirements:
 - No constraints on altitude, duration of level legs (like ~10 min sometimes for OH reactivity), cloud penetration, or smoke
 - Need at least one extra N₂ cylinder for suitcase flights
 - Forward cargo bay temperature should be kept above freezing at all times
 - Access on tarmac for occasional calibrations
 - Hose for pump exhaust on ground (may contain NO (0.1%)); open space to change NO cylinders
- No perceived gaps and issues