Supporting Information Section

Effective Absorption Cross Sections and Photolysis Rates of Anthropogenic and Biogenic Secondary Organic Aerosols

Dian E. Romonosky, Nujhat N. Ali, Mariyah N. Saiduddin, Michael Wu, Hyun Ji (Julie) Lee, Paige K. Aiona, and Sergey A. Nizkorodov*

Department of Chemistry, University of California, Irvine, California 92697, USA.

* Corresponding author phone and e-mail: 949-824-1262, nizkorod@uci.edu

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Purity of Reagents

Table S1. Reagents Used.

All precursors used for the generation of SOA samples that were used in this study, abbreviations by which they are referred to in the main text, and their CAS numbers, commercial sources and purities.

Precursor	CAS-number	Abbreviated Name	Source	Commercial Purity
1-Methylpyrrole	96-54-8	1MPYR	Sigma Aldrich	99%
2-Methylpyrrole	636-41-9	2MPYR	Ark Pharm, Inc.	95%
α-Pinene	7785-26-4	APIN	Sigma Aldrich	98%
β-Myrcene	123-35-3	BMYR	Fisher	92.9%
β-Pinene	18172-67-3	BPIN	Fisher	98%
d-Limonene	5989-27-5	LIM	Sigma Aldrich	97%
Farnesene	502-61-4	FAR	Sigma Aldrich	99%
Guaiacol	90-05-1	GUA	Sigma Aldrich	> 98%
Imidazole	288-32-4	IMID	Fisher	99%
Isoprene	78-79-5	ISO	Sigma Aldrich	99%
Linalool	78-70-6	LIN	Fisher	97%
Ocimene	13877-91-3	OCI	Sigma Aldrich	> 90%
p-Xylene	106-42-3	XYL	Sigma Aldrich	> 99%

Verification of Beer-Lambert Law

This section contains examples of verification of linearity of the measured base-10 absorbance as a function of the mass concentration of SOA in the solution. Such tests have been carried out for all SOA examined in this work, typically at 280 nm, where all SOA had easily detectable absorbance.

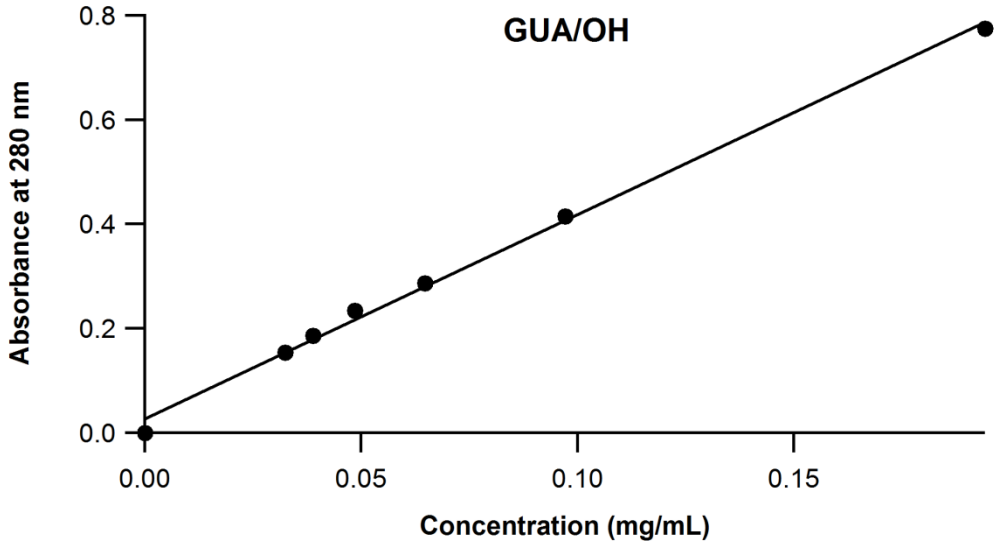

Figure S1. Absorbance of GUA/OH SOA vs. solution mass concentration.

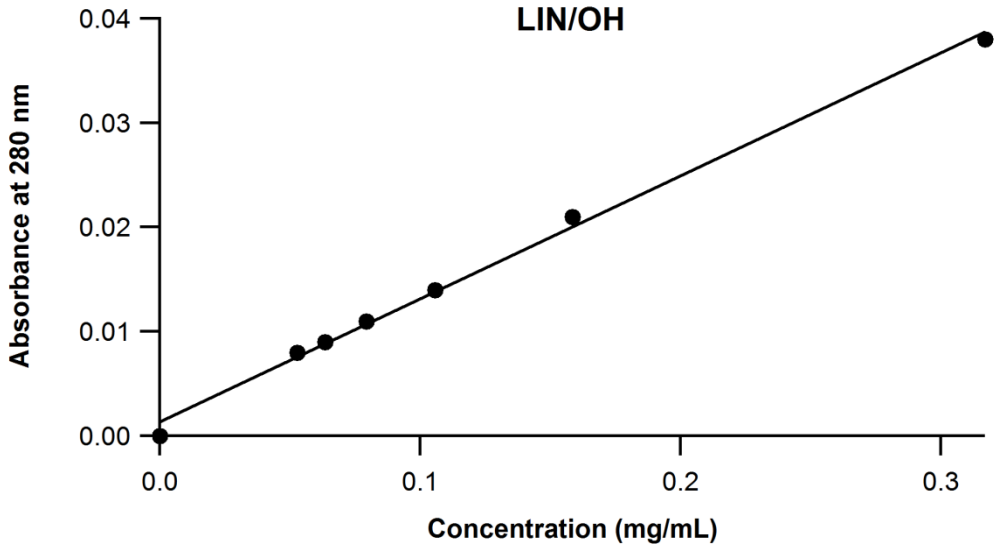

Figure S2. Absorbance of LIN/OH SOA vs. solution mass concentration.

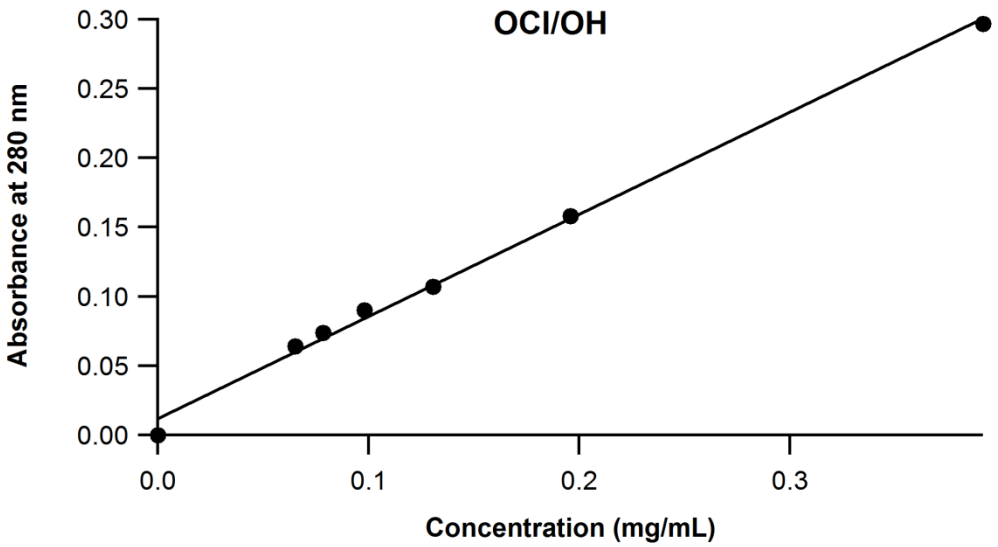

Figure S3. Absorbance of OCI/OH SOA vs. solution mass concentration.

MAC Values Reported in this Work

This section provides images of all the MAC values reported in this study. The codes and oxidation conditions for VOC are explained in Table 1 and Table 2 of the manuscript. In all cases, the black lines correspond to MAC values obtained by averaging results of several independent trials, and shaded areas correspond to ± one standard deviation. MAC values were converted into effective absorption cross sections, as explained in Section S3.

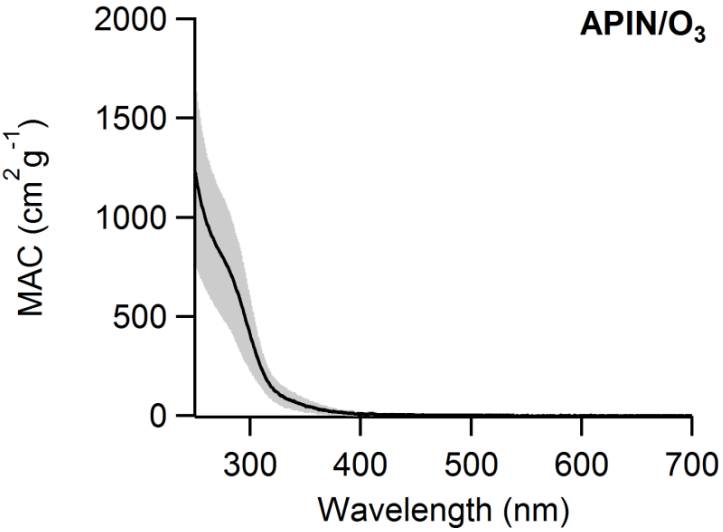

Figure S4. Mass absorption coefficient of APIN/O_3 SOA.

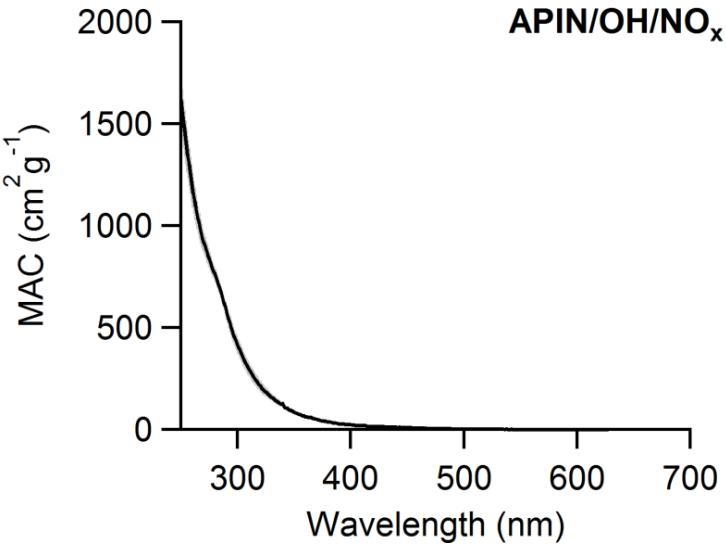

Figure S5. Mass absorption coefficient of APIN/OH/NO_x SOA.

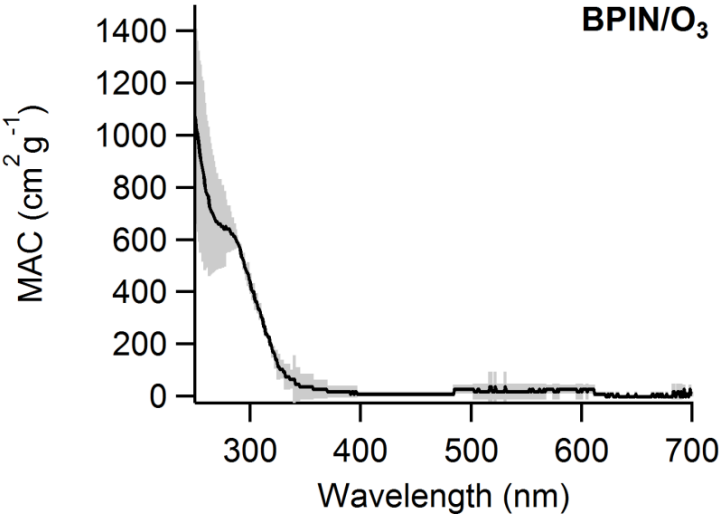

Figure S6. Mass absorption coefficient of BPIN/O_3 SOA.

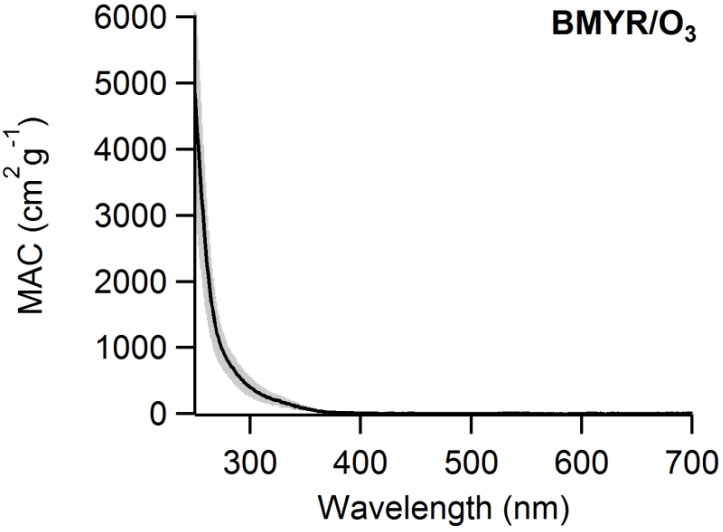

Figure S7. Mass absorption coefficient of BMYR/O_3 SOA.

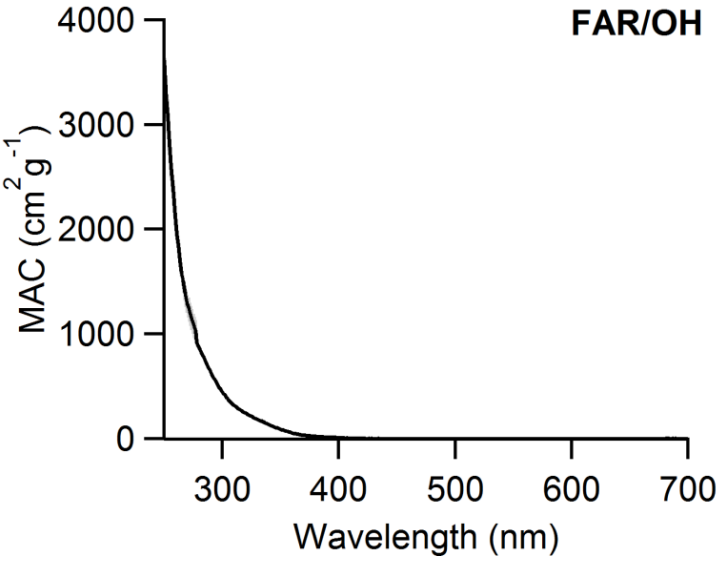

Figure S8. Mass absorption coefficient of FAR/OH SOA.

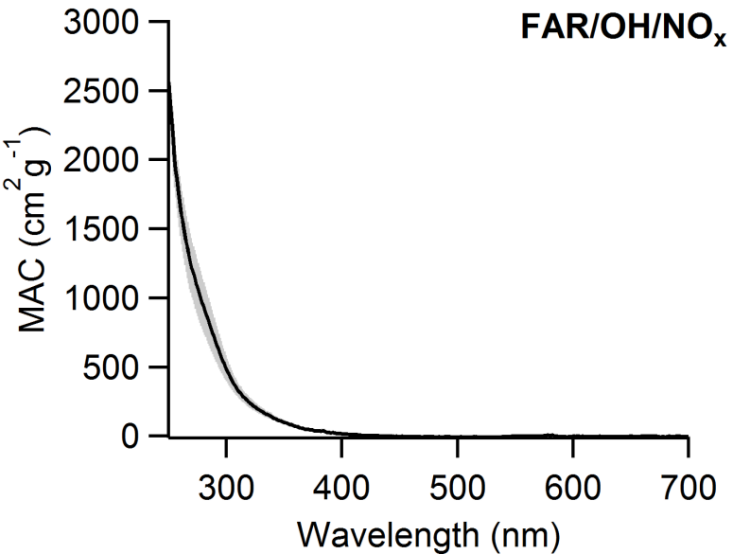

Figure S9. Mass absorption coefficient of FAR/OH/NO_x SOA.

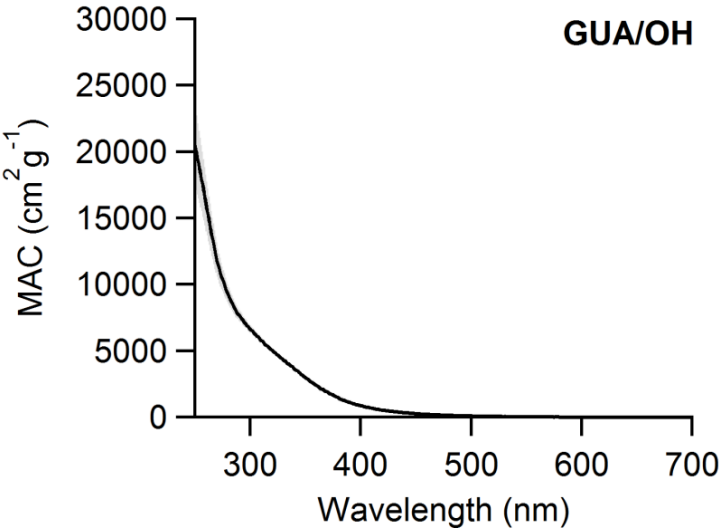

Figure S10. Mass absorption coefficient of GUA/OH SOA.

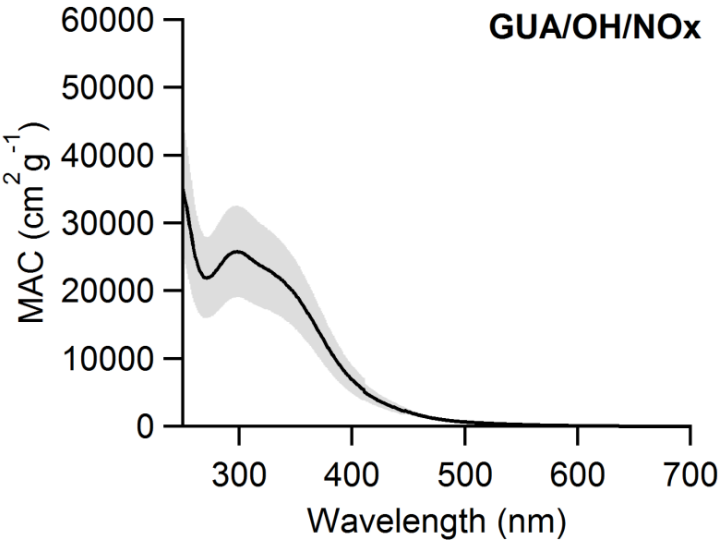

Figure S11. Mass absorption coefficient of GUA/OH/NO_x SOA.

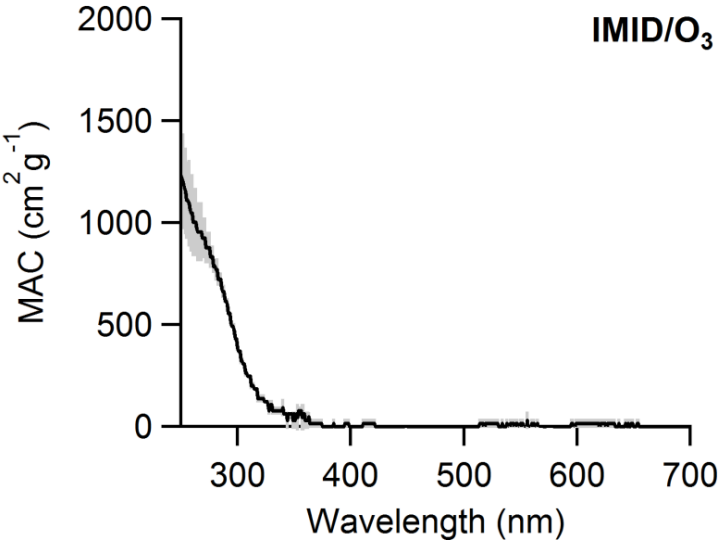

Figure S12. Mass absorption coefficient of IMID/O_3 SOA.

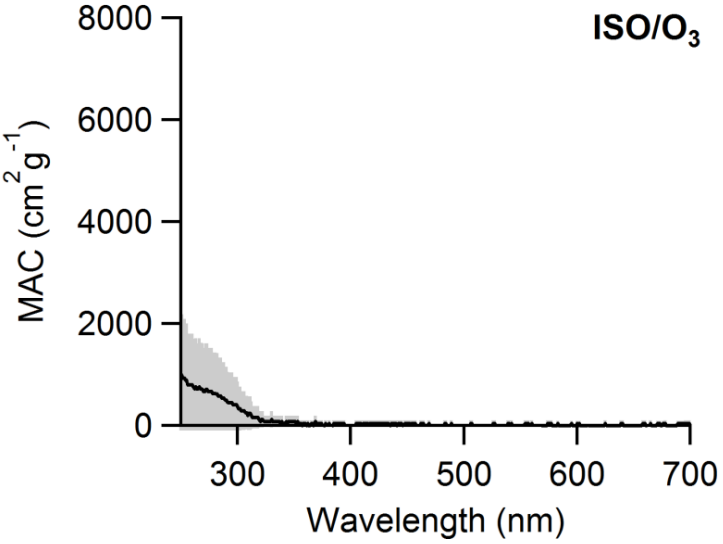

Figure S13. Mass absorption coefficient of ISO/O_3 SOA.

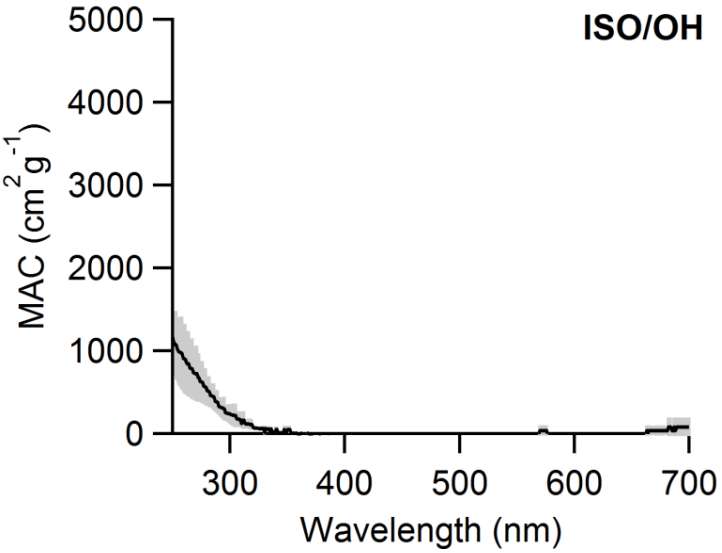

Figure S14. Mass absorption coefficient of ISO/OH SOA.

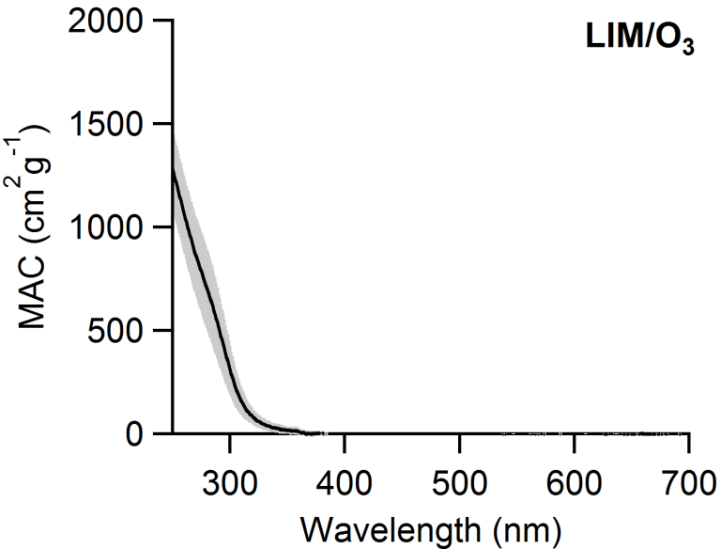

Figure S15. Mass absorption coefficient of LIM/O_3 SOA.

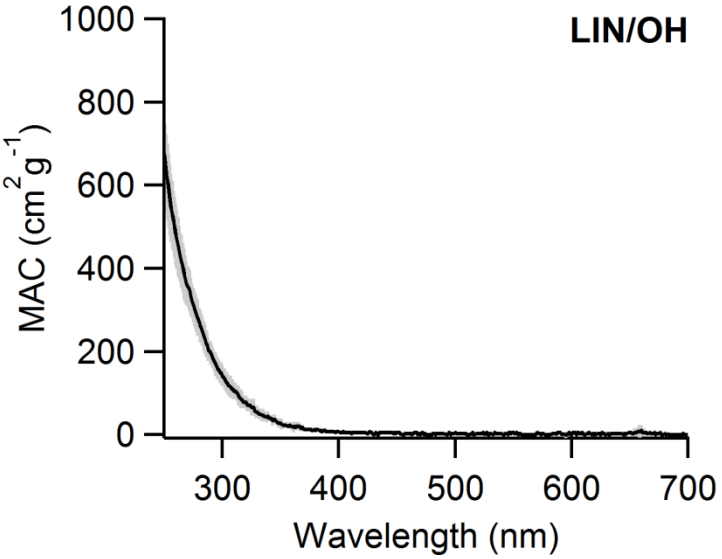

Figure S16. Mass absorption coefficient of LIN/OH SOA.

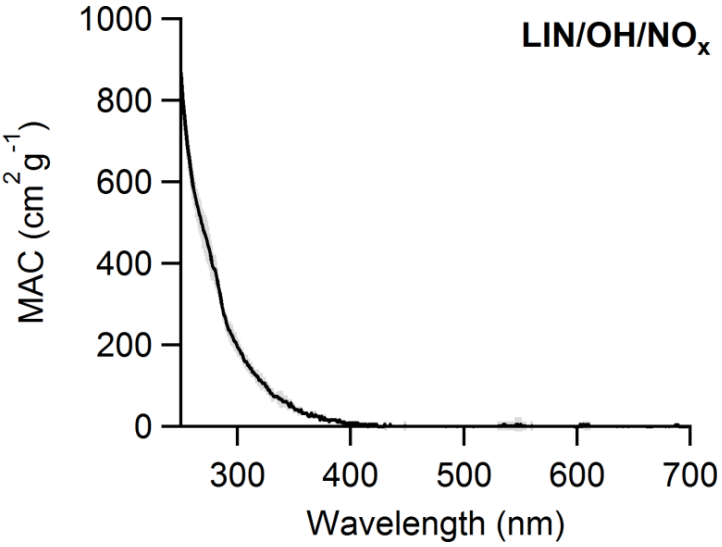

Figure S17. Mass absorption coefficient of LIN/OH/NO_x SOA.

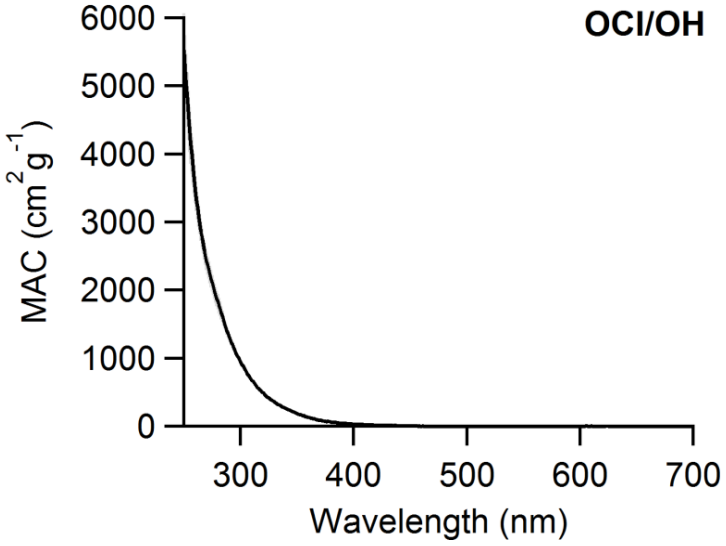

Figure S18. Mass absorption coefficient of OCI/OH SOA.

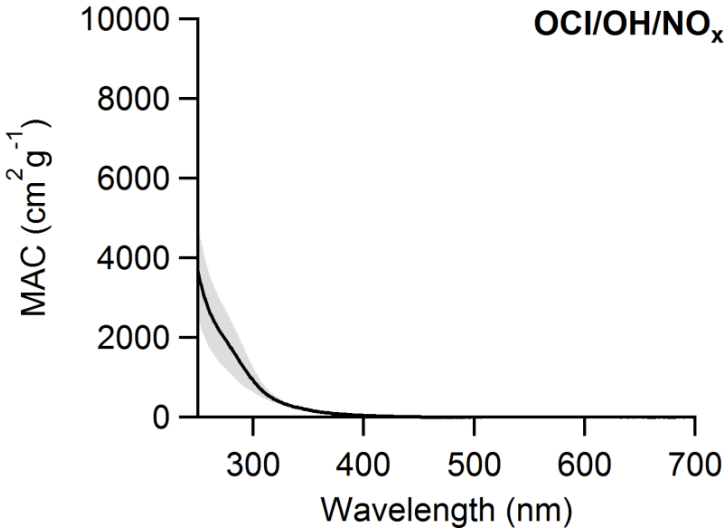

Figure S19. Mass absorption coefficient of OCI/OH/NO_x SOA.

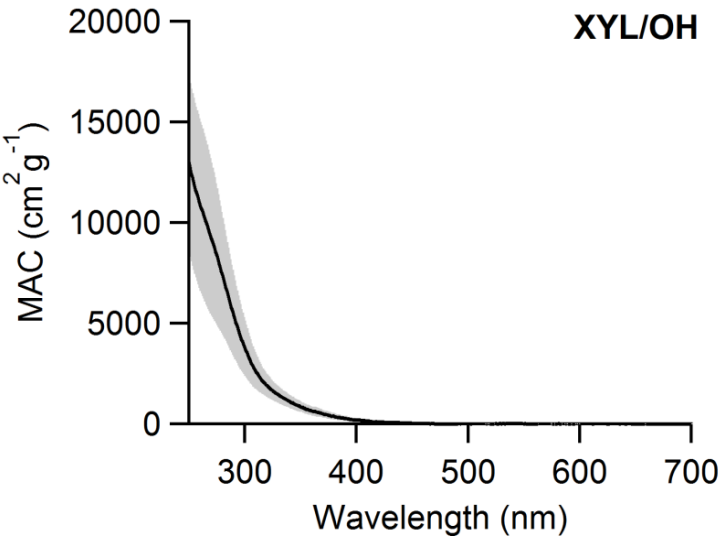

Figure S20. Mass absorption coefficient of XYL/OH SOA.

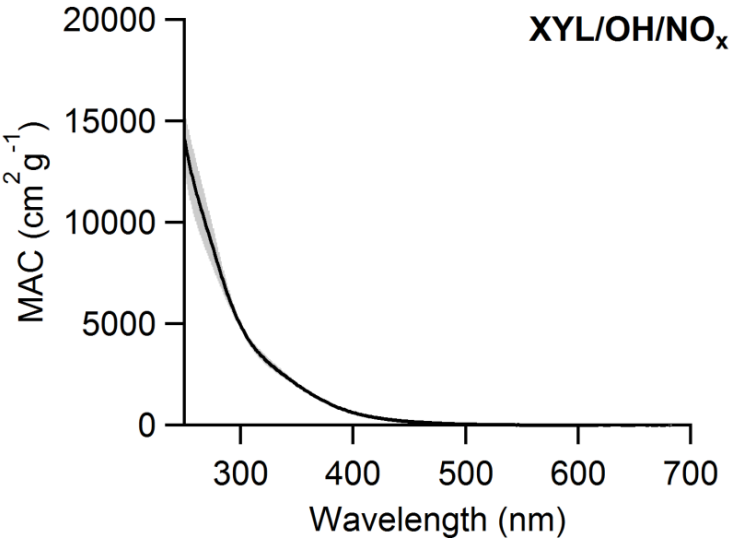

Figure S21. Mass absorption coefficient of XYL/OH/NO_x SOA.

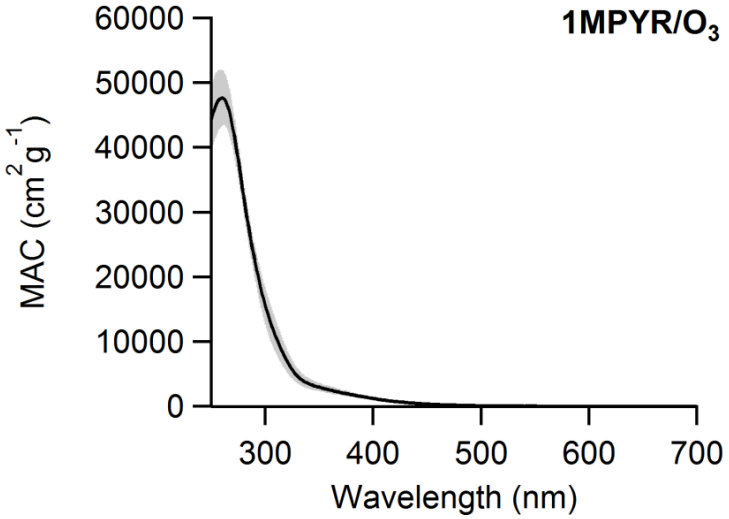

Figure S22. Mass absorption coefficient of 1MPYR/O_3 SOA.

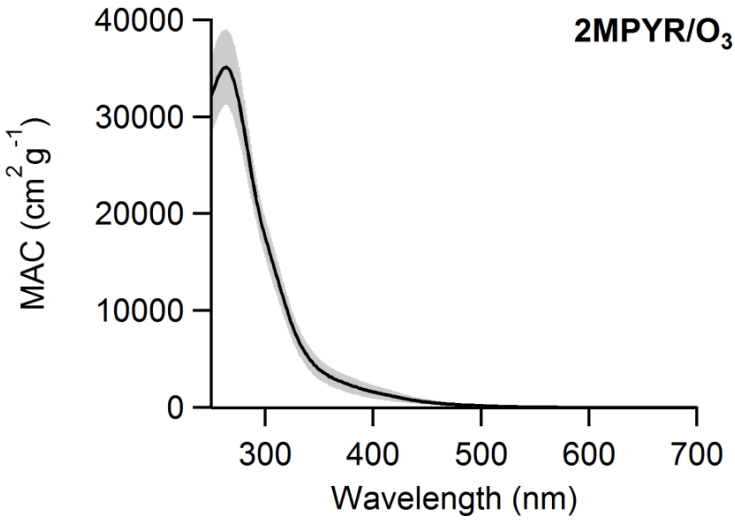

Figure S23. Mass absorption coefficient of 2MPYR/O_3 SOA.

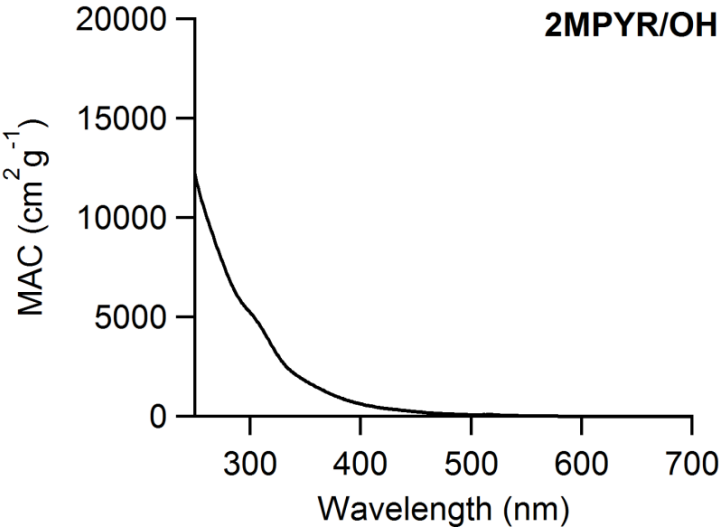

Figure S24. Mass absorption coefficient of 2MPYR/OH SOA.

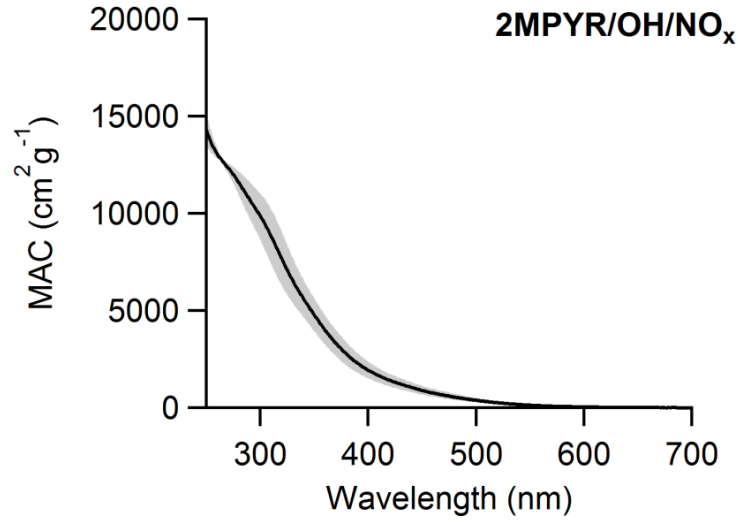

Figure S25. Mass absorption coefficient of 2MPYR/OH/NO_x SOA.

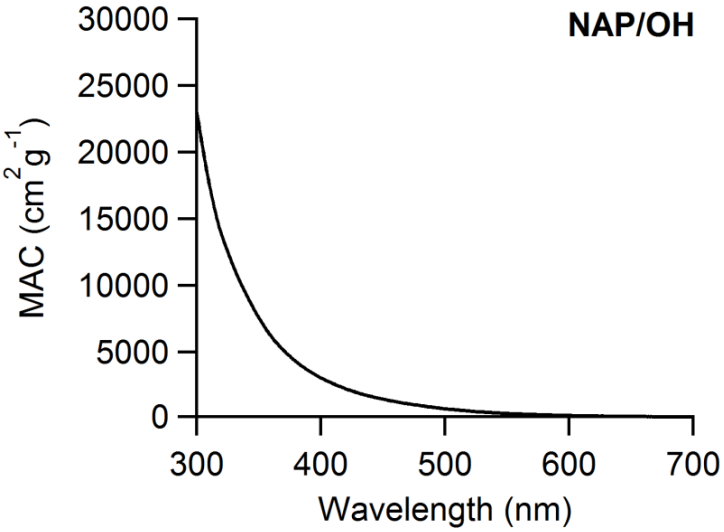

Figure S26. Mass absorption coefficient of NAP/OH SOA.

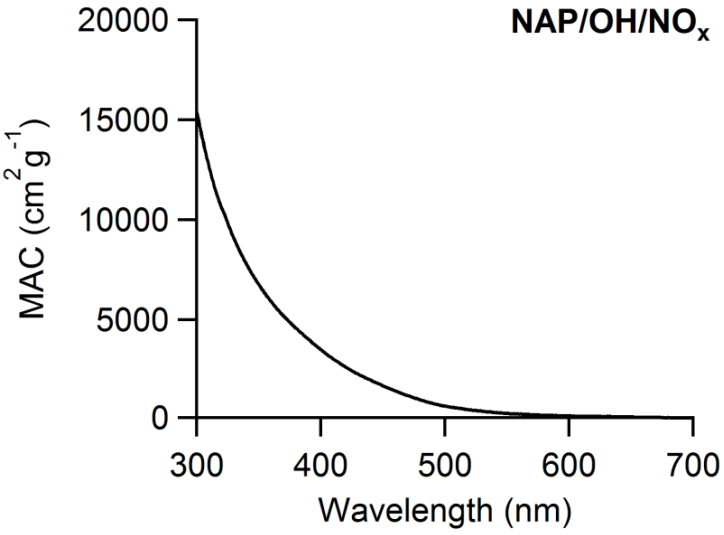

Figure S27. Mass absorption coefficient of NAP/OH/NO_x SOA.

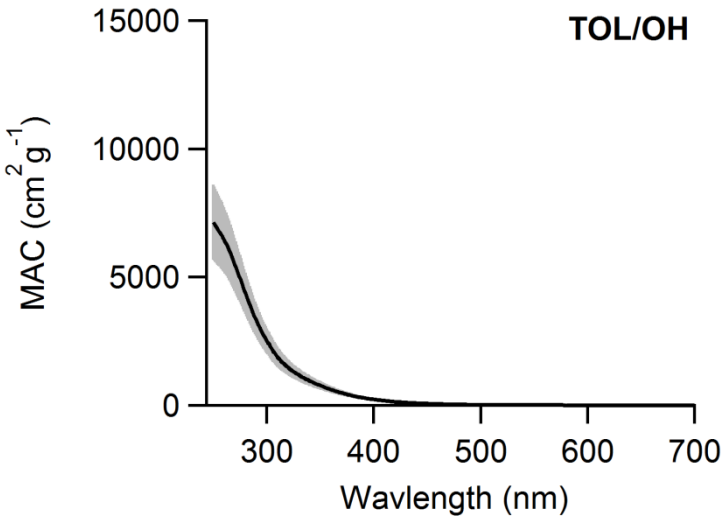

Figure S28. Mass absorption coefficient of TOL/OH SOA.

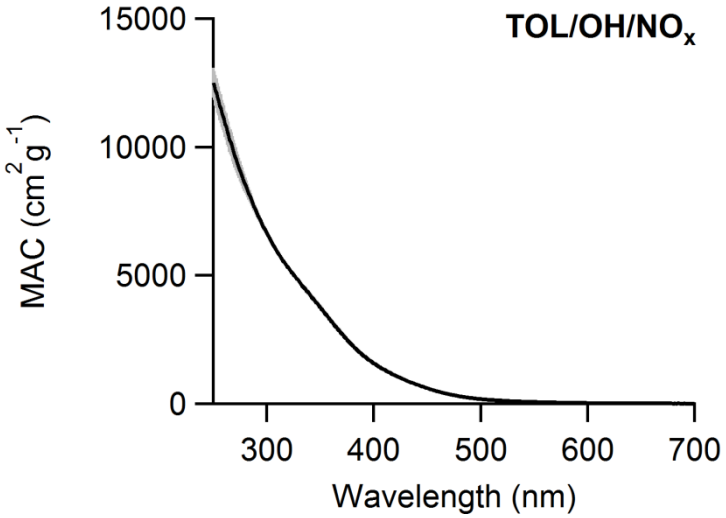

Figure S29. Mass absorption coefficient of TOL/OH/NO_x SOA.

Section S3. Tabulated MAC Values Reported in this Work

The MAC values as a function of wavelength will be uploaded to the supporting information section of the website as a separate ASCII file to simplify use of these data by other researchers.