

Appendix A

Table A1 – Summary of experiments conducted during this study. ^aNo SO₂ data collected.

	Experiment	Thrust setting	Fan Speed (N1)	UV light source	Average [OH] (molecules/cm ³)
1	07/15/09	7%	24.8	Black lights	^a
2	07/16/09	7%	24.5	Sunlight	^a
3	07/17/09	30%	53.7	Black lights	1.3 x 10 ⁶
4	07/20/09	4%	19.2	Black lights	1.4 x 10 ⁷
5	07/21/09	4%	19.0	Sunlight	1.2 x 10 ⁷
6	07/22/09	85%	82.2	Sunlight	1.9 x 10 ⁶
7	07/23/09	7% (center port)	25.1	Black lights	1.9 x 10 ⁶
8	07/24/09	4%	19.7	Black lights	1.0 x 10 ⁷

Table A2 – Fuel properties of jet fuel (JP-8) using for all tests during this study.

	Units	Value	ASTM Method
Hydrogen	Wt %	14.0	D3701
Aromatics	Vol %	14.1	D1319
Olefins	Vol %	1.4	D1319
Saturates	Vol %	84.5	D1319
Naphthalenes	Vol %	1.26	D1840
Sulfur	ppmw	608	D5453

Table A3 – List of SOA precursors and lumping used in SOAM-II model. VOC emission factors calculated from SUMMA canisters measurements (Presto et al., 2010). ^aNot detected.

SOAM II compound class	Precursor species	4% (mg kg fuel ⁻¹)	85% (mg kg fuel ⁻¹)
ALK4	propane	37.4	32.6
	isobutane	42.7	42.2
	butane	24.8	29.2
	isopentane	34.0	29.9
	pentane	12.0	15.6
	cyclopentane	12.6	1.8
	2,3-dimethylbutane	2.8	2.0
	2-methylpentane	50.2	1.0
	3-methylpentane	12.5	^a
	hexane	15.4	2.4

	methylcyclopentane	11.2	a
ALK5	cyclopropane	2.9	a
	cyclohexane	51.9	a
	2-methylhexane/2,3-dimethylpentane	6.7	a
	3-methylhexane	24.5	a
	2,2-dimethylbutane	1.5	a
	heptane	5.9	a
	methylcyclohexane	14.4	a
	2,3,4-trimethylpentane	5.3	a
	2-methylheptane	7.1	a
	4-methylheptane	5.6	1.8
	3-methylheptane	5.7	2.9
	octane	7.5	0.9
	nonane	36.1	a
	decane	2.5	33.4
	undecane	93.7	15.8
	dodecane	108.3	16.1
	tridecane	47.4	1.9
tetradecane	4.9	0.9	
ARO1	ethylbenzene	3.9	1.0
	isopropylbenzene	4.8	0.8
	propylbenzene	16.6	1.4
	sec-butylbenzene	39.4	1.6
	butylbenzene	8.5	a
ARO2	p-xylene	4.8	3.8
	o-xylene	5.2	a
	3-ethyltoluene	15.8	a
	4-ethyltoluene	7.7	3.1
	1,3,5-trimethylbenzene	14.4	1.0
	2-ethyltoluene	12.6	34.2
	1,2,4-trimethylbenzene/tert-butylbenzene	41.9	7.4
	1,2,3-trimethylbenzene	47.0	1.7
	1,3-diethylbenzene	10.2	1.8
	1,4-diethylbenzene	46.7	1.9
	1,2-diethylbenzene	10.9	1.9
	hexylbenzene	16.6	a
	1,2,4,5-tetramethylbenzene	27.2	a
OLE1	propene	696.2	6.3
	1-butene	194.6	2.2
	1-pentene	91.2	10.8
	trans-2-pentene	15.7	a
	cis-2-pentene	8.4	a
	1-hexene	81.1	a
	cis-3-hexene	7.2	a
	trans-2-hexene	9.5	a
	2-methyl-2-pentene	2.1	0.6
	c-2-hexene	6.1	14.4
	1,3-hexadiene (trans)	6.3	a
	1-octene	5.9	1.2
	1-heptene and 2,2,4-trimethylpentane	61.5	a
OLE2	iso-butene	71.7	5.5
	1,3-butadiene	230.3	a
	trans-2-butene	61.0	4.3
	cis-2-butene	11.7	0.9
	1,2-butadiene	6.4	a

	3-methyl-1-butene	29.5	a
	2-methyl-1-butene	30.3	1.0
	2-methyl-2-butene	6.0	a
	cyclopentene	95.5	a
	4-methyl-1-pentene and 3-methyl-1-pentene	27.2	0.7
	2-methyl-1-pentene	10.6	a
	cyclohexene	14.5	3.7
	2,3-dimethyl-2-pentene	7.5	1.0
	styrene	8.2	a
TOL	Toluene	84.7	3.0
BEN	Benzene	232.0	72.4
MXY	m-xylene	26.4	1.1
NAP	Napthalene	45.9	1.6