

Table of Contents

1.	Introduction.....	1
2.	The Aerosol Mass Spectrometer.....	7
2.1.	Set Up of the AMS.....	8
2.2.	Identification of Chemical Compounds in the AMS	10
2.3.	Quantification in the AMS.....	13
2.4.	Data Acquisition Modes	17
3.	Laboratory Experiment - RIE of Water	21
3.1.	Set-Up	22
3.2.	Materials and Methods.....	23
3.3.	Results.....	25
3.3.1.	Physical Properties	25
3.3.2.	Water Content of Oxalate Particles.....	28
3.3.3.	Analysis of OxAc Contamination	31
3.4.	Summary and Conclusions	34
4.	Chamber Study - Organic Nitrate Detection in an AMS	37
4.1.	SAPHIR	38
4.2.	Experiments	39
4.3.	Results.....	42
4.3.1.	Vapor Pressure of Organic Nitrates	45
4.3.2.	Nitrate Fragmentation Ratio.....	48
4.4.	Summary and Conclusions	49
5.	Ambient Measurements at Cabauw, NL.....	51
5.1.	Cabauw - CESAR Tower.....	51
5.2.	Measurement Results.....	54
5.3.	Instrument Comparisons	59
5.3.1.	SMPS	59
5.3.2.	MARGA.....	62
5.3.3.	MARGA-Sizer	64
5.4.	PMF Analysis of the Organic Particulate Aerosol.....	66
5.5.	Organic Nitrates in Ambient Measurements	73
5.6.	Summary and Conclusions	78
6.	Summary	81
7.	Literature.....	85

Appendix	93
A.1 Data Analysis	93
A.1.1 Software used	93
A.1.2 <i>m/z</i> Fitting	93
A.1.3 Baseline	93
A.1.4 DC marker	93
A.1.5 Fragmentation Wave.....	94
A.1.6 High Resolution Fitting	95
A.2 AMS Data.....	96
A.2.1 Batch Diurnals	96
A.2.2 Size Distributions	98
A.3 Comparison	104
A.3.1 SMPS	104
A.3.2 MARGA 2008	105
A.3.3 MARGA 2009	106
A.3.4 MARGA Sizer.....	107
A.4 PMF Data	110