Atmospheric Composition Variable Standard Name Recommendations

4.1 Overview

In the ICARTT V2.0 file format standard an additional variable definition, called a standard variable name, is now required in an effort to improve usability, standardization, and machine-readability. The standard variable name is designed to be a tag used along with the PI generated variable short name. This document recommends a set of guidelines for creating standard variable names for different types of measurements and provides a list of standard variable names that cover the current list of measurements conducted during the airborne filed studies on atmospheric composition.

The proposed standard names are constructed using controlled vocabulary terms with four parts: measurement category (MeasurementCategory), core name (CoreName), measurement mode (MeasurementMode), and descriptive attributes (DescriptiveAttributes), which are separated by an underscore:

Standard Name = MeasurementCategory_CoreName_MeasurementMode_DescriptiveAttributes

This structure is similar to that of the Climate and Forecast Metadata Convention (CF) and the Geoscience Standard Names (GSN) ontology. It is designed to support data discovery, distribution, and use, by accurately describing all variables from different measurements/instruments while using a consistent format for interoperability. For data discovery, the MeasurementCategory and CoreName can be used to conduct a broad search to identify all measurements of the same physical quantity from different instruments and/or field studies. The DescriptiveAttributes can then be used to narrow down the search for data of interest. As discussed in later sections, the number and nature of DescriptiveAttributes are dependent on the type of measurement.

4.1.1 MeasurementCategory

MeasurementCategory broadly groups all measurement standard names into one of twelve categories. Additionally, it provides uniqueness when using only CoreNames could be ambiguous (e.g., a particle number concentration could be describing cloud droplets or aerosols). Within each MeasurementCategory, the format of each standard name is consistent (i.e. variable standard names within each category have the same number and type of descriptive attributes). The types and/or number of attributes have been tailored to each type of measurement (e.g., aerosol optical property vs. aerosol composition) or medium (e.g., trace gas vs. aerosol); therefore, MeasurementCategory is defined by the measurement medium and type of measurements. See table 4.1.1 for the complete list of MeasurementCategories. The variable standard names for each MeasurementCategory are introduced in sections 4.2 to 4.8.

Table 4.1.1: List of Values for MeasurementCategory

MeasurementCategory	Description	Number of Descriptive Attributes
Gas	Trace gases abundance and isotope ratios	2
AerComp	Aerosol particle composition	3
AerMP	Aerosol particle microphysical properties	4
AerOpt	Aerosol particle optical properties	4
CldComp	Cloud droplet composition	3
CldMicro	Cloud droplet microphysical properties	3
CldMacro	Cloud droplet macrophysical properties	0*
CldOpt	Cloud droplet optical properties	1
Met	Meteorology parameters	0*
GasJValue	Gas phase photolytic coefficients	3
AquJValue	Aqueous phase photolytic coefficients	3
Platform	Measurement platform (e.g., aircraft, ship, motor vehicles) navigation and attitude	0*
Rad	Radiation measurements	1

* While no descriptive attributes exist for these measurement categories, '_None' must be used in place of the DescriptiveAttribute.

4.1.2 CoreName

The CoreName is the basic identification of the physical quantity being reported. The CoreNames chosen are those that have been commonly used in literature, which are, by definition, "community acceptable".

4.1.3 MeasurementMode

The MeasurementMode refers to the sampling technique of the measurement. The modes chosen are similar to the ESA Atmospheric Validation Data Centre (EVDC) acquisition method

metadata attributes, which are InSitu, Numerical Simulation, Remote Sensing, and Sample. The complete list is given in Table 4.1.2.

Table 4.1.2: List of Values for MeasurementMode

MeasurementMode	**Description**
InSitu	Sampling in close proximity of the instrument or the sampling platform
VertColumn	Measurement of a remotely sensed vertically integrated column, where the column measured is nominally perpendicular to the earth's surface
SlantColumn	Measurement of a remotely sensed vertically integrated column, where the column measured is not nominally perpendicular to the earth's surface (e.g. the instrument is sun-tracking)
Profile	Measurement of vertically resolved profile

4.1.4 DescriptiveAttributes

The descriptive attributes provide measurement and/or data reporting information relevant for data use, particularly when comparing results obtained with other methods of observations. The number and types of descriptive attributes are measurement-dependent; the attributes required for each MeasurementCategory can be found in their respective sections below. For certain measurements, DescriptiveAttributes may not be necessary. In this case, "None" will be used as the value for this attribute.

The following sections detail the controlled vocabulary pertaining to each MeasurementCategory for CoreNames and DescriptiveAttributes.

4.2 Trace Gas Standard Names:

The MeasurementCategory for trace gas is "Gas". The associated descriptive attributes are "MeasurementSpecificity" and "Reporting". The "MeasurementSpecificity" attribute specifies whether the CoreName represents a single species (S), combination of multiple species (M), or is not applicable (NA) for a gas phase reaction rate or ratio of species. The "Reporting" attribute describes the way a trace gas is reported, which are defined in Table 4.2.1. When reporting in standard temperature and pressure (STP), the temperature and pressure conditions under which the measurement is reported should be noted in the header or metadata of the data file, as "standard temperature" varies across the research community.

Table 4.2.1: Trace Gas Measurement Reporting Attributes

Reporting Attributes	Description
DVMR	Volumetric mixing ratio with respect to dry air (i.e., no water vapor)
AVMR	Volumetric mixing ratio with respect to ambient air
DMF	Molar fraction with respect to dry air
AMF	Molar fraction with respect to ambient air
ConcSTP	Number or mass concentration reported at standard temperature and pressure
ConcAMB	Number or mass concentration reported at ambient temperature and pressure
CNDAMB	Column integrated number density reported at ambient temperature and pressure
D13C	Deviations in the $^{13}C/^{12}C$ Stable Carbon Isotope Ratio relative to a standard
D14C	Deviations in the $^{14}C/^{12}C$ Carbon Isotope Ratio relative to a standard
dD	Deviations in the D/H Stable Hydrogen Isotope Ratio relative to a standard
d18O	Deviations in the $^{18}O/^{16}O$ Stable Oxygen Isotope Ratio relative to a standard

The CoreNames for trace gas measurements are given in Table 4.2.2. The names of specific species are a combination of chemical formulas and chemical names. The chemical names used for volatile organic carbon species follow a standard nomenclature, which has been agreed upon by multiple measurement groups. In addition, most of these names are linked to Chemical Abstracts Service (CAS) numbers, which are unique for each chemical compound. In certain cases, some instruments do not have sufficient selectivity to measure individual specific trace gas species. These data are reported as the sum of multiple species or a group of species. For these lumped measurements, the core names are either those used in literature (e.g., NOy, PNs) or a combination of names for specific compounds (e.g., iButene1Butene for the sum of Isobutene and 1-Butene).

The following example provides the controlled vocabulary options for MeasurementMode, MeasurementSpecificity, and Reporting attribute that can be used in a trace gas standard name.

Trace Gases
Gas_CoreName_MeasurementMode_MeasurementSpecificity_Reporting

MeasurementMode = InSitu, VertColumn, SlantColumn, Profile
MeasurementSpecificity = S (single species), M (multiple species), NA (not applicable)
Reporting = DVMR, AVMR, DMF, AMF, ConcSTP, ConcAMB, CNDAMB, d13C, d14C, d2H, d18O

Example for an in-situ measurement of CO2 gas reported in molar fraction with respect to dry air: Gas_CO2_InSitu_S_DMF

Example for an in-situ measurement of total reactive nitrogen species reported in volumetric mixing ratio with respect to ambient air: Gas_NOy_InSitu_M_AVMR

Example for a remote sensing measurement of slant column NO2 gas reported column number density with respect to ambient air: Gas_NO2_SlantColumn_S_CNDAMB

Table 4.2.2 provides a list of trace gas CoreNames, along with definition, chemical formula, CAS number, and MeasurementSpecificity. For convenience, eight categories are used to group the variables: Oxygen Species, Hydrogen Species and Radicals; Nitrogen Species; Sulfur Species; Halogens and Halogenates; Hydrocarbons: Alkanes, Alkenes, and Alkynes; Hydrocarbons: Aromatics; Biogenic Volatile Organic Carbon Species; and Oxygenated Inorganic and Volatile Organic Carbon Species.

Table 4.2.2: List of Trace Gas CoreNames and Definitions

CoreName	**Definition**	**Chemical Formula**	**CAS Number**	**Specificity**
Oxygen Species, Hydrogen Species and Radicals				
H2	Hydrogen	H_2	1333-74-0	S
O2	Oxygen	O_2	7782-44-7	S
O2toN2ratio	Ratio of Oxygen to Nitrogen	N/A	N/A	NA
APO	Atmospheric Potential Oxygen (O_2 + 1.1 x (CO_2 - 350))	N/A	N/A	NA
HO2	Hydroperoxy radical	HO_2	3170-83-0	S
CH3O2	Methylperoxy radical	CH_3O_2	2143-58-0	S
RO2	Sum of Organic Peroxy radicals	N/A	N/A	M
HO2RO2	Sum of Hydroperoxy radical and Organic Peroxy radicals	N/A	N/A	M
OH	Hydroxyl radical	OH	3352-57-6	S
OHR	OH Reactivity	N/A	N/A	NA
H2O2	Hydrogen peroxide	H_2O_2	7722-84-1	S
O3	Ozone	O_3	10028-15-6	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
O1D	O(1D)	O		S
O3P	O(3P)	O		S
H	Hydrogen atom	H	12385-13-6	S
HCO	Formyl radical	HCO	2597-44-6	S
CH3	Methyl radical	CH_3	2229-07-4	S
CH3O	Methoxy radical	CH_3O	2143-68-2	S
C2H5O	Ethoxy radical	C_2H_5O	2154-50-9	S
CH3COO2	Peroxyacetyl radical	$C_2H_3O_3$	36709-10-1	S
CH3COO	Acetoxy radical	$C_2H_3O_2$	N/A	S
CH3CH2	Ethyl radical	C_2H_5	2025-56-1	S
CH3CO	Acetyl radical	C_2H_3O	3170-69-2	S
Nitrogen Species				
NH3	Ammonia	NH_3	7664-41-7	S
NF3	Nitrogen trifluoride	NF_3	7783-54-2	S
N2O	Nitrous oxide	N_2O	10024-97-2	S
NO	Nitric oxide	NO	10102-43-9	S
NO2	Nitrogen dioxide	NO_2	10102-44-0	S
NO3	Nitrate radical	NO_3	12033-49-7	S
N2O5	Nitrogen pentoxide	N_2O_5	10102-03-01	S
HNO2	Nitrous acid	HNO_2	7782-77-6	S
HNO3	Nitric acid	HNO_3	7697-37-2	S
HNO4	Peroxynitric acid	HNO_4	26404-66-0	S
HCN	Hydrogen cyanide	HCN	74-90-8	S
CH3CN	Acetonitrile	C_2H_3N	75-05-8	S
HNCO	Isocyanic acid	HNCO	75-13-8	S
Acrylonitrile	Acrylonitrile	C_3H_3N	107-13-1	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
MeAcrylonitrile	Methylacrylonitrile	C_4H_5N	126-98-7	S
PropNitrile	Propanenitrile	C_3H_5N	107-12-0	S
BenzNitrile	Benzenenitrile	C_7H_5N	100-47-0	S
Pyrrole	Pyrrole	C_4H_5N	109-97-7	S
C4H5N	Sum of C4H5N isomers	C_4H_5N	N/A	M
Pyridine	Pyridine	C_5H_5N	110-86-1	S
Nitromethane	Nitromethane	CH_3NO_2	75-52-5	S
ClNO2	Nitryl chloride	$ClNO_2$	13444-90-1	S
ClONO2	Chlorine nitrate	$ClNO_3$	14545-72-3	S
MeONO2	Methyl nitrate	CH_3NO_3	598-58-3	S
EthONO2	Ethyl nitrate	$C_2H_5NO_3$	625-58-1	S
nPropONO2	n-Propyl nitrate	$C_3H_7NO_3$	627-13-4	S
iPropONO2	Isopropyl nitrate	$C_3H_7NO_3$	1712-64-7	S
nButONO2	n-Butyl nitrate	$C_4H_9NO_3$	928-45-0	S
x2ButONO2	2-Butyl nitrate	$C_4H_9NO_3$	924-52-7	S
iButONO2	Isobutyl nitrate	$C_4H_9NO_3$	543-29-3	S
iButONO2and2ButONO2	Sum of Isobutyl nitrate and 2-Butyl nitrate	$C_4H_9NO_3$	N/A	M
tButONO2	t-Butyl nitrate	$C_4H_9NO_3$	0926-05-06	S
nPentONO2	n-Pentyl nitrate	$C_5H_{11}NO_3$	1002-16-0	S
x2PentONO2	2-Pentyl nitrate	$C_5H_{11}NO_3$	21981-48-6	S
x3PentONO2	3-Pentyl nitrate	$C_5H_{11}NO_3$	N/A	S
iPentONO2	Isopentyl nitrate	$C_5H_{11}NO_3$	543-87-3	S
x3Me2ButONO2	3-Methyl-2-butyl nitrate	$C_5H_{11}NO_3$	N/A	S
x2OxoEthONO2	2-Oxoethyl nitrate	$C_2H_3NO_4$	72673-15-5	S
AcetylONO2	Acetyl nitrate	$C_2H_3NO_4$	591-09-3	S
PAN	Peroxyacetyl nitrate	$C_2H_3NO_5$	2278-22-0	S
APAN	Peroxyacryloyl nitrate	$C_3H_3NO_5$	N/A	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
PPN	Peroxylpropionyl nitrate	$C_3H_5NO_5$	5796-89-4	S
PBN	Peroxybutyryl nitrate	$C_4H_7NO_5$	N/A	S
PiBN	Peroxyisobutyric nitrate	$C_4H_7NO_5$	N/A	S
PPeN	Peroxypentyryl nitrate	$C_5H_9NO_5$	N/A	M
PBzN	Peroxybenzoyl nitrate	$C_7H_5NO_5$	N/A	S
MoPN	Methoxy Peroxyacetyl nitrate	$C_2H_6NO_6$	N/A	S
MPAN	Peroxymethacryloyl nitrate	$C_4H_5NO_5$	N/A	S
PNs	Sum of Peroxynitrates	N/A	N/A	M
ANs	Sum of Akylnitrates	N/A	N/A	M
NOx	Nitrogen oxides (NO + NO2)	N/A	N/A	M
NOy	Total Reactive Nitrogen	N/A	N/A	M
NOyasNO2	Total Reactive Nitrogen Converted to NO2	N/A	N/A	M
NOyasNO	Total Reactive Nitrogen Converted to NO	N/A	N/A	M
x2HydEthONO2	2-Hydroxyethyl nitrate	$C_2H_5NO_4$	16051-48-2	S
C3H7NO4	Sum of C3H7NO4 Hydroxy nitrates	$C_3H_7NO_4$	N/A	M
C3H5NO4	Sum of C3H5NO4 Carbonyl nitrates	$C_3H_5NO_4$	N/A	M
C4H7NO4	Sum of C4H7NO4 Isomers	$C_4H_7NO_4$	N/A	M
C4H7NO5	Sum of Isomers, including C4 Hydroxy Carbonyl Nitrates	$C_4H_7NO_5$	N/A	M
C4H9NO4	Sum of C4H9NO4 Hydroxy nitrates	$C_4H_9NO_4$	N/A	M
ISOPN	Sum of Isoprene Hydroxy Nitrate Isomers	$C_5H_9NO_4$	N/A	M
C5H9NO5	Sum of C5H9NO5 Isomers, including Hydroperoxy Nitrates of Isoprene	$C_5H_9NO_5$	N/A	M
NitroCatechol	Nitrocatechol, aka 4-nitrocatechol	$C_6H_5NO_4$	3316-09-04	S
NitroGuaiacol	Nitroguaiacol, including 4-	$C_7H_7NO_4$	N/A	M

CoreName	Definition	Chemical Formula	CAS Number	Specificity
	Nitroguaiacol and 5-Nitroguaiacol			
x4NitroGuaiacol	4-Nitroguaiacol	$C_7H_7NO_4$	3251-56-7	S
x5NitroGuaiacol	5-Nitroguaiacol	$C_7H_7NO_4$	636-93-1	S
Sulfur Species				
CS2	Carbon disulfide	CS_2	75-15-0	S
CH3SH	Methanethiol	CH_4S	74-93-1	S
DMS	Dimethyl sulfide	C_2H_6S	75-18-3	S
DMDS	Dimethyl disulfide	$C_2H_6S_2$	624-92-0	S
DMSO	Dimethyl sulfoxide	$(CH_3)_2SO$	67-68-5	S
DMSO2	Dimethyl sulfone	$(CH_3)_2SO_2$	67-71-0	S
H2SO4	Sulfuric acid	H_2SO_4	7664-93-9	S
MSA	Methanesulfonic acid	CH_4O_3S	75-75-2	S
OCS	Carbonyl sulfide	OCS	463-58-1	S
SF6	Sulfur hexafluoride	SF_6	2551-62-4	S
C2H4O3S	Sum of C2H4O3S isomers	$C_2H_4O_3S$	N/A	M
SO2F2	Sulfuryl fluoride	SO_2F_2	2699-79-8	S
SO2	Sulfur dioxide	SO_2	7446-09-05	S
HPMTF	Hydroperoxymethyl thioformate	$HOOCH_2SCHO$	N/A	S
Halogens and Halogenates				
Cl	Chlorine atom	Cl	22537-15-1	S
HCl	Hydrogen chloride	HCl	7647-01-0	S
Cl2	Chlorine	Cl_2	7782-50-5	S
ClO	Chlorine monoxide	ClO	14989-30-1	S
HOCl	Hypochlorous acid	HOCl	7790-92-3	S
Br	Bromine atom	Br	10097-32-2	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
HBr	Hydrogen bromide	HBr	10035-10-6	S
Br2	Bromine	Br_2	7726-95-6	S
BrCl	Bromine chloride	BrCl	13863-41-7	S
BrO	Bromine monoxide	BrO	15656-19-6	S
BrONO	Bromine nitrite	$BrNO_2$	N/A	S
BrONO2	Bromine nitrate	$BrNO_3$	40423-14-1	S
$BrNO_2$	Bromine nitrite	$BrNO_2$	N/A	S
HOBr	Hypobromous acid	HOBr	13517-11-8	S
Br2HOBr	Sum of HOBr and Br_2	N/A	N/A	M
Br2O	Dibromine monoxide	Br_2O	21308-80-5	S
BrCN	Cyanogen Bromide	BrCN	506-68-3	S
I	Iodine atom	I	14362-44-8	S
I2	Iodine	I_2	7553-56-2	S
IO	Iodine monoxide	IO	14696-98-1	S
HOI	Hypoiodous acid	HIO	14332-21-9	S
CH3COOCl	Chloroacetic acid	$C_2H_3ClO_2$	79-11-8	S
CH3Cl	Chloromethane	CH_3Cl	74-87-3	S
CH2Cl2	Dichloromethane	CH_2Cl_2	75-09-2	S
CHCl3	Chloroform	$CHCl_3$	67-66-3	S
CCl4	Tetrachloromethane	CCl_4	56-23-5	S
C2H5Cl	Chloroethane	C_2H_5Cl	75-00-3	S
CH3CHCl2	1,1-Dichloroethane	$C_2H_4Cl_2$	75-34-3	S
CH2ClCH2Cl	1,2-Dichloroethane	$C_2H_4Cl_2$	0107-06-02	S
CH3CCl3	Methyl chloroform; 1,1,1-Trichloroethane	$C_2H_3Cl_3$	71-55-6	S
CHCl2CH2Cl	1,1,2-Trichloroethane	$C_2H_3Cl_3$	79-00-5	S
CHCl2CHCl2	1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$	79-34-5	S
C2H3Cl	Chloroethene	C_2H_3Cl	75-01-4	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
tCHClCHCl	trans-1,2-Dichloroethene	$C_2H_2Cl_2$	156-60-5	S
cCHClCHCl	cis-1,2-Dichloroethene	$C_2H_2Cl_2$	156-59-2	S
CCl2CH2	1,1-Dichloroethene	$C_2H_2Cl_2$	75-35-4	S
C2HCl3	Trichloroethene	C_2HCl_3	79-01-6	S
C2Cl4	Tetrachloroethene	C_2Cl_4	127-18-4	S
x12DiClPropane	1,2-Dichloropropane	$C_3H_6Cl_2$	78-87-5	S
x123TriClPropane	1,2,3-Trichloropropane	$C_3H_5Cl_3$	96-18-4	S
x13DiClPropene	1,3-Dichloropropene	$C_3H_4Cl_2$	542-75-6	S
x23DiCl1Propene	2,3-Dichloro-1-propene	$C_3H_4Cl_2$	78-88-6	S
hexClButadiene	Hexachlorobutadiene	C_4Cl_6	87-68-3	S
ClBenzene	Chlorobenzene	C_6H_5Cl	108-90-7	S
pDiClBenzene	1,4-Dichlorobenzene	$C_6H_4Cl_2$	106-46-7	S
mDiClBenzene	1,3-Dichlorobenzene	$C_6H_4Cl_2$	541-73-1	S
oDiClBenzene	1,2-Dichlorobenzene-	$C_6H_4Cl_2$	95-50-1	S
x124TriClBenzene	1,2,4-Trichlorobenzene	$C_6H_3Cl_3$	120-82-1	S
x123TriClBenzene	1,2,3-Trichlorobenzene	$C_6H_3Cl_3$	87-61-6	S
x135TriClBenzene	1,3,5-Trichlorobenzene	$C_6H_3Cl_3$	108-70-3	S
aClToluene	Benzyl chloride	C_7H_7Cl	100-44-7	S
oClToluene	1-Chloro-2-methylbenzene	C_7H_7Cl	95-49-8	S
pClToluene	1-Chloro-4-methylbenzene	C_7H_7Cl	95-49-8	S
mClToluene	1-Chloro-3-methylbenzene	C_7H_7Cl	108-41-8	S
CH3Br	Bromomethane	CH_3Br	74-83-9	S
CH2Br2	Dibromomethane	CH_2Br_2	74-95-3	S
CHBr3	Bromoform	$CHBr_3$	75-25-2	S
C2H5Br	Bromoethane	C_2H_5Br	74-96-4	S
CH2BrCH2Br	1,2-Dibromoethane	$C_2H_4Br_2$	106-93-4	S
nC3H7Br	n-Propyl bromide	C_3H_7Br	106-94-5	S
BrBenzene	Bromobenzene	C6H5Br	108-86-1	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
CH3I	Iodomethane	CH_3I	74-88-4	S
CH2I2	Diiodomethane	CH_2I_2	75-11-6	S
C2H5I	Iodoethane	C_2H_5I	75-03-6	S
CH2BrCl	Bromochloromethane	CH_2BrCl	74-97-5	S
CHBr2Cl	Dibromochloromethane	$CHBr_2Cl$	124-48-1	S
CHBrCl2	Bromodichloromethane	$CHBrCl_2$	75-27-4	S
CH2BrCHBrCH2Cl	1,2-Dibromo-3-chlorobenzene	$C_3H_5Br_2Cl$	96-12-8	S
CH2ClI	Chloroiodomethane	CH_2ClI	593-71-5	S
CH2BrI	Bromoiodomethane	CH_2BrI	557-68-6	S
CFC11	Trichlorofluoromethane	CCl_3F	75-69-4	S
CFC12	Dichlorodifluoromethane	CCl_2F_2	75-71-8	S
CFC13	Chlorotrifluoromethane	$CClF_3$	75-72-9	S
CF4	Tetrafluoromethane	CF_4	75-73-0	S
CFC112	Tetrachloro-1,2-difluoroethane	$C_2Cl_4F_2$	76-12-0	S
CFC113	1,1,2-Trichlorotrifluoroethane	$C_2Cl_3F_3$	76-13-1	S
CFC114	1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$	76-14-2	S
CFC115	Chloropentafluoroethane	C_2ClF_5	76-15-3	S
C2F6	Hexafluoroethane	C_2F_6	76-16-4	S
H1202	Dibromodifluoromethane	CBr_2F_2	75-61-6	S
H1211	Bromochlorodifluoromethane	$CBrClF_2$	353-59-3	S
H1301	Bromotrifluoromethane	$CBrF_3$	75-63-8	S
H2402	1,2-Dibromotetrafluoroethane	$C_2Br_2F_4$	124-73-2	S
HCFC123	1,1-Dichloro-2,2,2-trifluoroethane	$C_2HCl_2F_3$	306-83-2	S
HCFC124	1-Chloro-1,2,2,2-tetrafluoroethane	C_2HClF_4	2837-89-0	S
HCFC141b	1,1-Dichloro-1-fluoroethane	$C_2H_3Cl_2F$	1717-00-6	S
HCFC142b	1-Chloro-1,1-difluoroethane	$C_2H_3ClF_2$	75-68-3	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
HCFC133a	1-Chloro-2,2,2-trifluoroethane	$C_2H_2ClF_3$	75-88-7	S
HCFC21	Dichlorofluoromethane	$CHCl_2F$	75-43-4	S
HCFC22	Chlorodifluoromethane	$CHClF_2$	75-45-6	S
HFC125	Pentafluoroethane	C_2HF_5	354-33-6	S
HFC134a	1,1,1,2-Tetrafluoroethane	$C_2H_2F_4$	811-97-2	S
HFC143a	1,1,1-Trifluoroethane	$C_2H_3F_3$	420-46-2	S
HFC152a	1,1-Difluoroethane	$C_2H_4F_2$	75-37-6	S
C3F8	Octafluoropropane	C_3F_8	76-19-7	S
HFC23	Trifluoromethane	CHF_3	75-46-7	S
HFC227ea	1,1,1,2,3,3,3-Heptafluoropropane	C_3HF_7	431-89-0	S
HFC32	Difluoromethane	CH_2F_2	75-10-5	S
HFC365mfc	1,1,1,3,3-Pentafluorobutane	$C_4H_5F_5$	406-58-6	S
HFC236fa	1,1,1,3,3,3-Hexafluoropropane	$C_3H_2F_6$	690-39-1	S
Hydrocarbons: Alkanes, Alkenes, and Alkynes				
CH4	Methane	CH_4	74-82-8	S
x13CH4	^{13}CH4-Methane	$^{13}CH_4$	14762-74-4	S
x14CH4	^{14}CH4-Methane	$^{14}CH_4$	2772-68-1	S
CH3D	CH3D-Methane	CH_3D	676-49-3	S
Ethane	Ethane	C_2H_6	74-84-0	S
Ethene	Ethene	C_2H_4	74-85-1	S
Ethyne	Ethyne	C_2H_2	74-86-2	S
Propane	Propane	C_3H_8	74-98-6	S
Propene	Propene	C_3H_6	0115-07-01	S
Propyne	Propyne	C_3H_4	74-99-7	S
Propadiene	Propadiene	C_3H_4	463-49-0	S
nButane	n-Butane	C_4H_{10}	106-97-8	S
iButane	Isobutane	C_4H_{10}	75-28-5	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
iButene	Isobutene	C_4H_8	0115-11-7	S
x1Butene	1-Butene	C_4H_8	106-98-9	S
iButene1Butene	Sum of Isobutene and 1-Butene	C_4H_8	N/A	M
c2Butene	cis-2-Butene	C_4H_8	590-18-1	S
t2Butene	trans-2-Butene	C_4H_8	624-64-6	S
CycButane	Cyclobutane	C_4H_8	287-23-0	S
Butadiene	1,3-Butadiene	C_4H_6	106-99-0	S
nPentane	n-Pentane	C_5H_{12}	109-66-0	S
iPentane	Isopentane	C_5H_{12}	78-78-4	S
Neopentane	Neopentane	C_5H_{12}	463-82-1	S
x1Pentene	1-Pentene	C_5H_{10}	109-67-1	S
c2Pentene	cis-2-Pentene	C_5H_{10}	627-20-3	S
t2Pentene	trans-2-Pentene	C_5H_{10}	0646-04-08	S
x2Me1Butene	2-Methyl-1-butene	C_5H_{10}	563-46-2	S
x3Me1Butene	3-Methyl-1-butene	C_5H_{10}	563-45-1	S
x2Me2Butene	2-Methyl-2-butene	C_5H_{10}	513-35-9	S
CycPentane	Cyclopentane	C_5H_{10}	287-92-3	S
CycPentene	Cyclopentene	C_5H_8	142-29-0	S
nHexane	n-Hexane	C_6H_{14}	110-54-3	S
x2MePentane	2-Methylpentane	C_6H_{14}	107-83-5	S
x3MePentane	3-Methylpentane	C_6H_{14}	96-14-0	S
MePentanes	Sum of 2-Methylpentane and 3-Methylpentane	C_6H_{14}	N/A	M
x22DimeButane	2,2-Dimethylbutane	C_6H_{14}	75-83-2	S
x23DimeButane	2,3-Dimethylbutane	C_6H_{14}	79-29-8	S
1Hexene	1-Hexene	C_6H_{12}	592-41-6	S
CycHexane	Cyclohexane	C_6H_{12}	110-82-7	S
MeCycPentane	Methylcyclopentane	C_6H_{12}	96-37-7	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
nHeptane	n-Heptane	C_7H_{16}	142-82-5	S
x2MeHexane	2-Methylhexane	C_7H_{16}	591-76-4	S
x3MeHexane	3-Methylhexane	C_7H_{16}	589-34-4	S
x22DimePentane	2,2-Dimethylpentane	C_7H_{16}	590-35-2	S
x23DimePentane	2,3-Dimethylpentane	C_7H_{16}	565-59-3	S
x24DimePentane	2,4-Dimethylpentane	C_7H_{16}	0108-08-07	S
x33DimePentane	3,3-Dimethylpentane	C_7H_{16}	562-49-2	S
MeCycHexane	Methylcyclohexane	C_7H_{14}	108-87-2	S
nOctane	n-Octane	C_8H_{18}	111-65-9	S
x224TrimePentane	2,2,4-Trimethylpentane	C_8H_{18}	540-84-1	S
x234TrimePentane	2,3,4-Trimethylpentane	C_8H_{18}	565-75-3	S
x2MeHeptane	2-Methylheptane	C_8H_{18}	592-27-8	S
x3MeHeptane	3-Methylheptane	C_8H_{18}	589-81-1	S
nNonane	n-Nonane	C_9H_{20}	111-84-2	S
nDecane	n-Decane	$C_{10}H_{22}$	124-18-5	S
nUndecane	n-Undecane	$C_{11}H_{24}$	1120-21-4	S
nDodecane	nDodecane	$C_{12}H_{26}$	112-40-3	S
Dodecane	Sum of all dodecane isomers	$C_{12}H_{26}$	N/A	M
Biogenic Volatile Organic Carbon Species				
Isoprene	Isoprene	C_5H_8	78-79-5	S
IsopreneFuran	Sum of Isoprene and Furan	N/A	N/A	M
aPinene	alpha-Pinene	$C_{10}H_{16}$	80-56-8	S
bPinene	beta-Pinene	$C_{10}H_{16}$	127-91-3	S
Camphene	Camphene	$C_{10}H_{16}$	79-92-5	S
Tricyclene	Tricyclene	$C_{10}H_{16}$	508-32-7	S
aTerpinene	alpha-Terpinene	$C_{10}H_{16}$	99-86-5	S
gTerpinene	gamma-Terpinene	$C_{10}H_{16}$	99-85-4	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
Myrcene	Myrcene	$C_{10}H_{16}$	123-35-3	S
Limonene	Limonene	$C_{10}H_{16}$	138-86-3	S
LimoneneD3Carene	Sum of Limonene and Δ3-Carene	$C_{10}H_{16}$	N/A	M
bPineneMyrcene	Sum of beta-Pinene and Myrcene	$C_{10}H_{16}$	N/A	M
Sabinene	Sabinene	$C_{10}H_{16}$	3387-41-5	S
dLimonene	D-Limonene	$C_{10}H_{16}$	5989-27-5	S
Terpinolene	Terpinolene	$C_{10}H_{16}$	586-62-9	S
Monoterpenes	Sum of Monoterpenes	$C_{10}H_{16}$	N/A	M
Linalool	Linalool	$C_{10}H_{18}O$	78-70-6	S
Terpineol	Terpineol	$C_{10}H_{18}O$	8006-39-1	S
aTerpineol	alpha-Terpineol	$C_{10}H_{18}O$	98-55-5	S
Geraniol	Geraniol	$C_{10}H_{18}O$	N/A	M
tGeraniol	trans-Geraniol	$C_{10}H_{18}O$	106-24-1	S
cGeraniol	cis-Geraniol	$C_{10}H_{18}O$	106-25-2	S
SabineneHyrate	Sabinene hyrdate	$C_{10}H_{18}O$	546-79-2	S
Borneol	Borneol	$C_{10}H_{18}O$	N/A	M
Pulegone	Pulegone	$C_{10}H_{16}O$	89-82-7	S
LFenchone	L-Fenchone	$C_{10}H_{16}O$	7787-20-4	S
Fenchol	Fenchol	$C_{10}H_{16}O$	2217-02-09	S
Camphor	Camphor	$C_{10}H_{16}O$	N/A	M
aCedrene	alpha-cedrene	$C_{15}H_{24}$	469-61-4	S
aHumulene	alpha-Humulene	$C_{15}H_{24}$	6753-98-6	S
Guaiol	Guaiol	$C_{15}H_{26}O$	489-86-1	S
tNeroidol	trans-Neroidol	$C_{15}H_{26}O$	40716-66-3	S
Hydrocarbons: Aromatics				
Benzene	Benzene	C_6H_6	71-43-2	S
Toluene	Toluene	C_7H_8	108-88-3	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
oXylene	o-Xylene	C_8H_{10}	95-47-6	S
mXylene	m-Xylene	C_8H_{10}	108-38-3	S
pXylene	p-Xylene	C_8H_{10}	106-42-3	S
EthBenzene	Ethylbenzene	C_8H_{10}	100-41-4	S
mpXylene	Sum of m-Xylene and p-Xylene	C_8H_{10}	N/A	M
EthBenzmpXylene	Sum of Ethylbenzene and mp-Xylene	C_8H_{10}	N/A	M
C8Aromatics	Sum of C8-Aromatics	C_8H_{10}	N/A	M
C9Aromatics	Sum of C9-Aromatics	C_9H_{12}	N/A	M
Ethynylbenzene	Ethynylbenzene	C_8H_6	536-74-3	S
Styrene	Styrene	C_8H_8	100-42-5	S
nPropBenzene	n-Propylbenzene	C_9H_{12}	103-65-1	S
iPropBenzene	Isopropylbenzene	C_9H_{12}	98-82-8	S
x123TrimeBenzene	1,2,3-Trimethylbenzene	C_9H_{12}	526-73-8	S
x124TrimeBenzene	1,2,4-Trimethylbenzene	C_9H_{12}	95-63-6	S
x135TrimeBenzene	1,3,5-Trimethylbenzene	C_9H_{12}	108-67-8	S
x2EthToluene	2-Ethyltoluene	C_9H_{12}	611-14-3	S
x3EthToluene	3-Ethyltoluene	C_9H_{12}	620-14-4	S
x4EthToluene	4-Ethyltoluene	C_9H_{12}	622-96-8	S
pCymene	para-Cymene	$C_{10}H_{14}$	99-87-6	S
C10Aromatics	Sum of C10-Aromatics	$C_{10}H_{14}$	N/A	M
tButBenzene	tert-Butylbenzene	$C_{10}H_{14}$	98-06-6	S
nButBenzene	n-Butylbenzene	$C_{10}H_{14}$	104-51-8	S
mDiethBenzene	1,3-Eiethylbenzene	$C_{10}H_{14}$	141-93-5	S
pDiethBenzene	1,4,- Eiethylbenzene	$C_{10}H_{14}$	0105-05-05	S
oDiethBenzene	1,2,- Eiethylbenzene	$C_{10}H_{14}$	0135-01-03	S
C11Aromatics	Sum of C11-Aromatics	$C_{11}H_{16}$	N/A	M
Naphthalene	Naphthalene	$C_{10}H_8$	91-20-3	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
Benzaldehyde	Benzaldehyde	C_7H_6O	100-52-7	S
DHT	Sum of Dihydroxytoluene Isomers	$C_7H_8O_2$	N/A	M
Phenol	Phenol	C_6H_5OH	108-95-2	S
Cresols	Sum of Cresol Isomers (Hydroxytoluenes)	C_7H_8O	N/A	M
Creosol	Creosol	$C_8H_{10}O_2$	93-51-6	S
Oxygenated Inorganic and Volatile Organic Carbon Species				
CO	Carbon monoxide	CO	630-08-0	S
CO2	Carbon dioxide	CO_2	124-38-9	S
x13CO2	13CO2-Carbon dioxide	$^{13}CO_2$	1111-72-4	S
x14CO2	14CO2-Carbon dioxide	$^{14}CO_2$	51-90-1	S
x18OCO	18OCO-Carbon dioxide	^{18}OCO	N/A	S
CHOCHO	Glyoxal	$C_2H_2O_2$	107-22-2	S
CH3COCHO	Methyl glyoxal	$C_3H_4O_2$	78-98-8	S
CH3OH	Methanol	CH_4O	67-56-1	S
CH2O	Formaldehyde	CH_2O	50-00-0	S
CH3OOH	Methyl hydroperoxide	CH_4O_2	3031-73-0	S
HMHP	Hydroxymethyl hydroperoxide	CH_4O_3	15932-89-5	S
HCOOH	Formic acid	CH_2O_2	64-18-6	S
C2H5OH	Ethanol	C_2H_6O	64-17-5	S
CH3CHO	Acetaldehyde	C_2H_4O	75-07-0	S
Glycolaldehyde	Glycolaldehyde	$C_2H_4O_2$	141-46-8	S
CH3COOH	Acetic acid	$C_2H_4O_2$	64-19-7	S
MeFormate	Methyl Formate	$C_2H_4O_2$	107-31-3	S
HAA	Hydroxyacetic acid; Glycolic acid	$C_2H_4O_3$	79-14-1	S
PAA	Peracetic Acid	$C_2H_4O_3$	79-21-0	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
iPropanol	Isopropanol	C_3H_8O	67-63-0	S
Propanal	Propanal	C_3H_6O	123-38-6	S
Acetone	Acetone	C_3H_6O	67-64-1	S
AcetonePropanal	Sum of Acetone and Propanal	C_3H_6O	N/A	M
Acrolein	Acrolein	C_3H_4O	0107-02-08	S
C3H6O2	Sum of C3H6O2 Isomers, including Hydroxyacetone	$C_3H_6O_2$	N/A	M
EthFormate	Ethyl Formate	$C_3H_6O_2$	109-94-4	S
MeAcetate	Methyl acetate	$C_3H_6O_2$	79-20-9	S
C2H5COOH	Propanoic acid	$C_3H_6O_2$	79-09-4	S
C3H6O3	Sum of C3H6O3 Isomers, including Hydroperoxy Acetone	$C_3H_6O_3$	N/A	M
Butanal	Butanal	C_4H_8O	123-72-8	S
iButanal	Isobutanal	C_4H_8O	78-84-2	S
MEK	Methyl Ethyl Ketone	C_4H_8O	78-93-3	S
ButanalMEK	Sum of Butanal and MEK	C_4H_8O	N/A	M
C4Carbonyls	Sum of C4-Carbonyls	C_4H_8O	N/A	M
EthAcetate	Ethyl acetate	$C_4H_8O_2$	141-78-6	S
x14Dioxane	1,4-Dioxane	$C_4H_8O_2$	123-91-1	S
C4H8O3	Sum of C4H8O3 Isomers, including C4 Dihydroxy Carbonyls	$C_4H_8O_3$	N/A	M
MAC	Methacrolein	C_4H_6O	78-85-3	S
MVK	Methyl Vinyl Ketone	C_4H_6O	78-94-4	S
MVKMAC	Sum of MVK and Methacrolein	C_4H_6O	N/A	M
E2Butenal	(E)-2-Butenal, trans-Crotonaldehyde	C_4H_6O	123-73-9	S
Z2Butenal	(Z)-2-Butenal, cis-Crotonaldehyde	C_4H_6O	15798-64-8	S
x2Butenals	Sum of (Z)- and (E)-2-Butenal isomers, Crotonaldehyde	C_4H_6O	4170-30-3	M

CoreName	Definition	Chemical Formula	CAS Number	Specificity
x23Butanedione	2,3-Butanedione	$C_4H_6O_2$	431-03-8	S
C4H6O3	Sum of C4H6O3 Isomers, including C4 Hydroxy Dicarbonyls	$C_4H_6O_3$	N/A	M
Furan	Furan	C_4H_4O	110-00-9	S
x2Furanone	2-Furanone, including 2(5H)Furanone and 2(3H)Furanone	$C_4H_4O_2$	N/A	M
x23HFuranone	2(3H)-Furanone	$C_4H_4O_2$	20825-71-2	S
x25HFuranone	2(5H)-Furanone	$C_4H_4O_2$	497-23-4	S
SuccinicAnhyd	Succinic anhydride	$C_4H_4O_3$	108-30-5	S
C4H4O3	Sum of C4H4O3 Isomers	$C_4H_4O_3$	N/A	M
MaleicAnhyd	Maleic anhydride	$C_4H_2O_3$	108-31-6	S
MTBE	Methyl Tert-Butyl Ether	$C_5H_{12}O$	1634-04-04	S
MBO	2-Methyl-3-buten-2-ol	$C_5H_{10}O$	115-18-4	S
Pentanal	Pentanal	$C_5H_{10}O$	110-62-3	S
x2Pentanone	2-Pentanone	$C_5H_{10}O$	107-87-9	S
x3Pentanone	3-Pentanone	$C_5H_{10}O$	96-22-0	S
C5Carbonyls	Sum of C5-Carbonyls	$C_5H_{10}O$	N/A	M
ISOPOOHIEPOX	Sum of ISOPOOH and IEPOX	$C_5H_{10}O_3$	N/A	M
IEPOX	Sum of Isoprene Epoxy Diol Isomers	$C_5H_{10}O_3$	N/A	M
ISOPOOH	Sum of Isoprene Hydroxy Hydroperoxide Isomers	$C_5H_{10}O_3$	N/A	M
C5H8O3	Sum of C5O3H8 Compounds, including HPALDs Isomers	$C_5H_8O_3$	N/A	M
x2MeFuran	2-Methylfuran	C_5H_6O	534-22-5	S
x3MeFuran	3-Methylfuran	C_5H_6O	930-27-8	S
Furfural	Furfural	$C_5H_4O_2$	98-01-1	S
x3Furaldehyde	3-Furaldehyde	$C_5H_4O_2$	498-60-2	S

CoreName	Definition	Chemical Formula	CAS Number	Specificity
HPALDs	Sum of HPALDs	$C_5H_8O_3$	N/A	M
Hexanal	Hexanal	$C_6H_{12}O$	66-25-1	S
x2Hexanone	2-Hexanone	$C_6H_{12}O$	591-78-6	S
x3Hexanone	3-Hexanone	$C_6H_{12}O$	589-38-8	S
C6Carbonyls	Sum of C6-Carbonyls	$C_6H_{12}O$	N/A	M
CycHexanone	Cyclohexanone	$C_6H_{10}O$	108-94-1	S
DimeFurans	Sum of Dimethylfurans	C_6H_8O	N/A	M
x25DimeFuran	2,5-dimethylfuran	C_6H_8O	625-86-5	S
x24DimeFuran	2,4-dimethylfuran	C_6H_8O	3710-43-8	S
Phenol	Phenol	C_6H_6O	108-95-2	S
x5MeFurfural	5-methylfurfural	$C_6H_6O_2$	620-02-0	S
Catechol	Catechol	$C_6H_6O_2$	120-80-9	S
C6H4O3	Hydroxybenzoquinone – including any compounds that can be viewed as derivatives of a benzoquinone	$C_6H_4O_3$	N/A	M
Anisole	Anisole	C_7H_8O	100-66-3	S
C7H8O	Sum of C7H8O Isomers	C_7H_8O	N/A	M
Guaiacol	Guaiacol	$C_7H_8O_2$	90-05-1	S
BenzFuran	Benzofuran	C_8H_6O	271-89-6	S
Syringol	Syringol	$C_8H_{10}O_3$	91-10-1	S

4.3 Aerosol Standard Names:

The MeasurementCategory for aerosols is either “AerMP”, “AerComp”, or “AerOpt” for aerosol microphysical properties, aerosol composition, and aerosol optical properties, respectively. AerMP has four DescriptiveAttributes: MeasurementRH, SizingTechnique, SizeRange, and Reporting; AerComp has three DescriptiveAttributes: SizingTechnique, SizeRange, and Reporting; and AerOpt has four DescriptiveAttributes: MeasurementRH, WL, SizeRange, and Reporting. The CoreNames for aerosol variables are listed in Table 4.3.6.

For aerosol microphysical and optical measurements, relative humidity (RH) conditions are important because water vapor can condense onto the particle and change its size and optical properties. In-situ aerosol measurements can be made at different RH levels. Table 4.3.1 defines the three possible modes of aerosol measurements related to relative humidity levels (MeasurementRH): RHd, RHa, and RHsp. If "RHsp" is used, the specific humidity at which the measurement was taken should be documented in the variable description.

Table 4.3.1: List of Possible Aerosol Instrument RH values

MeasurementRH	**Description**
RHd	Reduced relative humidity in the sampling system, typically less than 40%
RHa	Relative humidity at ambient conditions
RHsp	Sampling system relative humidity at a specified level
None	Not applicable to variable

SizingTechnique is an important descriptive attribute because the measurement of the size of a single particle can vary when using different techniques (based on the properties of the particle, such as its composition, shape and density). Each technique has inherent assumptions, limitations, and operable ranges that are vital for proper interpretation and comparison of the data. Table 4.3.2 defines the values of "SizingTechnique" representing the different measurement techniques for particle size determination. If the SizingTechnique is "None", the SizeRange used must be "Total", which is typically for bulk measurements.

Table 4.3.2: List of Aerosol SizingTechniques

SizingTechnique	**Description**
Mobility	The electrical mobility diameter is the diameter of a sphere with the same migration velocity in a constant electric field as the particle of interest (i.e., migration velocity in a constant electric field). [1]
Optical	Size measurement made using the intensity of light scattered by a particle, related to particle size using a prescribed refractive index and assumed spherical shape.
Aerodynamic	The aerodynamic diameter is defined as the diameter of a sphere with standard density that settles at the same terminal velocity as the particle of interest. [1]
VacuumAerodynamic	The vacuum aerodynamic diameter is measured in a free-molecular flow regime (that is, in conditions where the ratio of the mean free path of the gas molecules to the size of the

	particle >> 1). [1]
LII	LII size is the refractory black carbon size derived from mass measurement and assumptions of void free density (1.8 g/cc) and spherical shape. Refractory black carbon mass is determined from incandescent light intensity at vaporization temperature.
Imaging	Measurement of a particle's size using an image.
Geometric	Geometric size derived from direct measurement(s)
Kelvin	Kelvin size refers to the smallest size at which condensation occurs at a particular supersaturation, as the saturation vapor pressure is dependent on the particle radius of curvature. Kelvin size is determined by varying the supersaturation of a vapor and counting the number droplets that activate.
None	No specific size determination – Bulk measurement

[1] DeCarlo, Peter F., et al. "Particle morphology and density characterization by combined mobility and aerodynamic diameter measurements. Part 1: Theory." Aerosol Science and Technology 38.12 (2004): 1185-1205.

The “SizeRange” delineates the range of particle sizes being measured. There are seven possible SizeRanges that can be used: Nucl, Accu, Coarse, Bulk, PM1, PMx, and XtoY, where X and Y can be Nucl, Accu, or Coarse, e.g., NucltoAccu (Table 4.3.3). When “Bulk” is used, SizingTechnique must be “None”.

Table 4.3.3: Summary of Aerosol Size Ranges

SizeRange	**Description**
Nucl	Nucleation-mode aerosols: 0.001-0.1 um diameter
Accu	Accumulation-mode aerosols: 0.1-1 um diameter
Coarse	Coarse-mode aerosols: greater than 1 um diameter
Bulk	No distinction in size of particle being measured
PM1	Submicron aerosols: less than 1 um diameter
PMx	Particles with diameter under X um diameter
XtoY	Size Range from X to Y, e.g., NucltoAccu

Aerosol optical properties are functions of wavelengths (WL) of light. Therefore, a measurement of aerosol optical properties is made at a specific wavelength. Table 4.3.4 lists the values for "WL" attributes, specifying the wavelength ranges within which instruments commonly operate.

Table 4.3.4: List of Wavelength Ranges for Aerosol Optical Property Measurements

WL	**Description**
UV	Ultraviolet: 10- 400 nm
Blue	450 - 495 nm
Green	495 - 570 nm
Red	620 - 700 nm
IR	Infrared: 700 - 10^6 nm
XtoY	Wavelength range from X to Y E.g., BluetoRed

Lastly, aerosol variables have a DescriptiveAttribute to indicate the reporting method used. Aerosol chemical compositions can be reported as mass concentrations at either STP or ambient temperature and pressure, mass fractions, or number fractions. Similarly, aerosol microphysical and optical properties can also be reported at either STP or ambient conditions. For variables that are dimensionless (e.g., fRH, SSA) the reporting attribute should be "None". See Table 4.3.5 for an explanation of each of these options. When reporting in standard temperature and pressure (STP), the temperature and pressure conditions under which the measurement is reported should be noted in the header or metadata of the data file, as "standard temperature" varies across the research community.

Table 4.3.5: Reporting Attribute Values for Aerosol Measurements

Reporting	**Description**
MassSTP	Mass concentration reported at standard temperature and pressure
MassAMB	Mass concentration reported at ambient temperature and pressure
MassFrac	Mass Fraction - Ratio of a constituent mass to the total aerosol mass concentration
NumFrac	Number Fraction - Ratio of a constituent number to the total aerosol number concentration
NumConcSTP	Number concentration of particle constituent at standard temperature and pressure

Reporting	Description
NumConcAMB	Number concentration of particle constituent at ambient temperature and pressure
STP	Aerosol properties reported at standard temperature and pressure
AMB	Aerosol properties reported at ambient temperature and pressure
None	For dimensionless variables
Other	Aerosol properties reported in a specific environment (e.g., mobile vehicle) with specified temperature and pressure

The following examples provide the controlled vocabulary options for MeasurementMode as well as the DescriptiveAttributes that apply to each aerosol classification category.

Aerosol Variables for Microphysical Properties:
AerMP_CoreName_MeasurementMode_MeasurementRH_SizingTechnique_SizeRange_Reporting
MeasurementMode = InSitu, VertColumn, SlantCol, Profl
MeasurementRH = RHd, RHa, RHsp
SizingTechnique = Mobility, Optical, Aerodynamic, Imaging, Kelvin, None
SizeRange = Nucl, Accu, Coarse, Bulk, PM1, PMx, XtoY
Reporting = STP, AMB, None

Example of an in-situ measurement of aerosol number size distribution reported at reduced relative humidity derived from an aerodynamic sizing technique for coarse-mode aerosols at standard temperature and pressure:
AerMP_NumSizeDist_InSitu_RHd_Aerodynamic_Coarse_STP

Aerosol Variables for Chemical Composition:
AerComp_CoreName_MeasurementMode_SizingTechnique_SizeRange_Reporting
MeasurementMode = InSitu, VertColumn, SlantCol, Profl
SizingTechnique = Aerodynamic, VacuumAerodynamic, LII, None
SizeRange = Nucl, Accu, Coarse, Bulk, PM1, PMx, XtoY
Reporting = MassSTP, MassAMB, MassFrac, NumFrac, NumConcSTP, NumConcAMB

Example of an in-situ measurement of organic aerosols derived using a vacuum aerodynamic technique for accumulation-mode aerosols reported as mass concentration at standard temperature and pressure:
AerComp_OrganicAerosol_InSitu_VacuumAerodynamic_Accu_MassSTP

Example of an in-situ measurement of bulk sea salt particles reported in number fraction:
AerComp_Seasalt_InSitu_None_Bulk_NumFrac

Aerosol Variables for Optical Properties:
AerOpt_CoreName_MeasurementMode_WL_MeasurementRH_SizeRange_Reporting
MeasurementMode = InSitu, VertColumn, SlantCol, Profl
WL = UV, Blue, Green, Red, IR, BluetoRed
MeasurementRH = RHd, RHa, RHsp
SizeRange = Nucl, Accu, Coarse, Bulk, PM1, PMx, XtoY
Reporting = STP, AMB, None

Example of an in-situ measurement of absorption measured at a red wavelength under reduced humidity conditions with a bulk aerosol size range reported in ambient conditions:
AerOpt_Absorption_InSitu_red_RHd_Bulk_AMB

Table 4.3.6: List of Aerosol Measurement CoreNames

Measurement Category	**CoreName**	**Definition**
AerMP	NumConc	Aerosol Number Concentration
AerMP	NonVolatileNumConc	Non-Volatile Aerosol Number Concentration
AerMP	SurfAreaConc	Aerosol Surface Area Concentration
AerMP	NonVolatileSurfAreaConc	Non-Volatile Aerosol Surface Area Concentration
AerMP	VolConc	Aerosol Volume Concentration
AerMP	NonVolatileVolConc	Non-Volatile Aerosol Volume Concentration
AerMP	CCN	Cloud Condensation Nuclei Concentration
AerMP	CCNtoCNRatio	Cloud Condensation Nuclei to Condensation Nuclei Ratio
AerMP	gRH	Aerosol Size Growth Factor
AerMP	MassSizeDist	Aerosol Mass Concentration Size Distribution
AerMP	MassConc	Aerosol Mass Concentration
AerMP	NonVolatileMassSizeDist	Non-Volatile Aerosol Mass Concentration Size Distribution
AerMP	NumSizeDist	Aerosol Number Concentration Size Distribution
AerMP	NonVolatileNumSizeDist	Non-Volatile Aerosol Number Size Distribution
AerMP	SurfAreaSizeDist	Aerosol Surface Area Concentration Size Distribution

Measurement Category	CoreName	Definition
AerMP	NonVolatileSurfAreaSizeDist	Non-Volatile Surface Area Concentration Size Distribution
AerMP	VolSizeDist	Aerosol Volume Concentration Size Distribution
AerMP	NonVolatileVolSizeDist	Non-Volatile Aerosol Volume Concentration Size Distribution
AerMP	EffSize	Aerosol Effective Size – Surface Area Weighted Average Size
AerMP	EffVar	Aerosol Effective Variance – Width of Aerosol Size Distribution
AerMP	MeanSize	Aerosol Mean Size (Radius or Diameter)
AerMP	BCFracIM	Black Carbon Faction of Internally Mixed
AerMP	BCCoatThick	Black Carbon Coating Thickness
AerComp	Acidity	Aerosol Particle Acidity
AerComp	BC	Aerosol Black Carbon
AerComp	BCMassSizeDist	Aerosol Black Carbon Mass Size Distribution
AerComp	BCNumSizeDist	Aerosol Black Carbon Number Size Distribution
AerComp	Bromide	Aerosol Bromide Ion
AerComp	Calcium	Aerosol Calcium Ion
AerComp	Chloride	Aerosol Chloride Ion
AerComp	Potassium	Aerosol Potassium Ion
AerComp	Magnesium	Aerosol Magnesium Ion
AerComp	Sodium	Aerosol Sodium Ion
AerComp	Nitrite	Aerosol Nitrite Ion
AerComp	Nitrate	Aerosol Nitrate Ion
AerComp	OrganicAerosol	Aerosol Organic matter
AerComp	HtoORatio	Hydrogen to Oxygen Ratio in Organic Aerosols
AerComp	Oxalate	Aerosol Oxalate Ion
AerComp	Sulfate	Aerosol Sulfate Ion

Measurement Category	CoreName	Definition
AerComp	TotalMass	Total Aerosol Mass
AerComp	WSOC	Aerosol Water Soluble Organic Carbon
AerComp	Ammonium	Aerosol Ammonium Ion
AerComp	Acid	Total Aerosol Acid
AerComp	NegativeIon	Total Aerosol Negative Ions
AerComp	PositiveIon	Total Aerosol Positive Ions
AerComp	BBParticles	Biomass Burning Particles
AerComp	Mineral	Mineral Particles
AerComp	Seasalt	Sea Salt Particles
AerComp	Soot	Soot Particles
AerComp	Beryllium7	Aerosol Beryllium7
AerComp	Lead210	Aerosol Lead210
AerComp	MSA	Aerosol Methanesulfonic Acid Mass
AerComp	ClO4	Aerosol perchlorate mass
AerComp	AmmBalance	Molar ratio of Ammonium to other inorganic ions in aerosol
AerComp	Density	Aerosol Density
AerComp	OADensity	OA Aerosol Density
AerComp	OAtoOC	Ratio of Organic Aerosol to Organic Carbon (OC)
AerComp	OSc	Carbon Oxidation State
AerComp	OrgNitrFraction	Fraction of nitrate coming from organic nitrates
AerComp	BioAerosol	Biological Aerosol
AerOpt	Absorption	Aerosol Absorption Coefficient
AerOpt	AbsorptionBrC	Aerosol particle measurement of light absorbance by particulate organic carbon
AerOpt	AbsorptionBrCLiquid	Liquid based measurement of light absorbance by particulate organic carbon
AerOpt	Scattering	Aerosol Scattering Coefficient

Measurement Category	CoreName	Definition
AerOpt	BackScattering	Aerosol Backscattering Coefficient
AerOpt	Extinction	Aerosol Extinction Coefficient
AerOpt	KExinction	Aerosol Extinction Cross Section
AerOpt	AngstromExponentAbs	Aerosol Angstrom Exponent for Absorption Coefficients
AerOpt	AngstromExponentScat	Aerosol Angstrom Exponent for Scattering Coefficients
AerOpt	AngstromExponentBackScat	Aerosol Angstrom Exponent for Backscattering Coefficients
AerOpt	AngstromExponentExt	Aerosol Angstrom Exponent for Extinction Coefficients
AerOpt	AngstromExponentAOD	Aerosol Angstrom Exponent for Aerosol Optical Depth
AerOpt	DepolarizationRatio	Aerosol Depolarization Ratio
AerOpt	TotalDepolarizationRatio	Aerosol and Molecular Depolarization Ratio
AerOpt	SSA	Single Scattering Albedo
AerOpt	AsymmetryParameterScat	Aerosol Scattering Asymmetry Parameter
AerOpt	fRHScat	Aerosol Scattering Hygroscopicity Factor
AerOpt	fRHBC	Black Carbon Specific Scattering Hygroscopicity Factor
AerOpt	Gamma	Aerosol Scattering Hygroscopicity Gamma Factor
AerOpt	PhaseFunctionExt	Aerosol Extinction Phase Function
AerOpt	PhaseFunctionScat	Aerosol Scattering Phase Function
AerOpt	PolarPhaseFunctionScat	Aerosol Scattering Polarized Phase Function
AerOpt	m	Real Component of Refractive Index
AerOpt	k	Imaginary Component of Refractive Index
AerOpt	n	Complex Refractive Index
AerOpt	AOD	Column-Integrated Extinction Aerosol Optical Depth
AerOpt	AAOD	Column-Integrated Absorption Aerosol Optical Depth

4.4 Cloud Standard Names:

Similar to aerosol variables, the MeasurementCategory for measurements of cloud properties are “CldOpt” for optical properties, “CldComp” for chemical composition, “CldMicro” for microphysical properties, and “CldMacro” for macrophysical properties. CoreNames for the variables in each of these categories are given in Table 4.4.4. The DescriptiveAttributes for CldMicro and CldComp are SizingTechnique, SizeRange, and Reporting. For CldOpt, the DescriptiveAttribute is WL for wavelength of light. There are no DescriptiveAttributes associated with CldMacro (i.e., DescriptiveAttributes = None).

SizingTechnique is an important property because a single cloud particle can have a different size based on the particle’s composition and shape, depending on which technique is used. Each technique has inherent assumptions, limitations, and operable ranges that are vital for proper interpretation and comparison of the data. The cloud particle size can be determined by one of two different techniques: Imaging or Optical. If there is no specific size determination (e.g., bulk measurements), the SizingTechnique is “None”. In this case, the SizeRange must be “Bulk”. See Table 4.4.1 for a description of these techniques.

Table 4.4.1: Summary of Cloud Droplet Sizing Techniques

SizingTechnique	**Description**
Imaging	Measurement of a particle's size using an image.
Optical	Size derived from the intensity of light scattered by a particle, related to particle size using a prescribed refractive index of 1.33 (for water).
None	No specific size determination – Bulk measurement

Another DescriptiveAttribute associated with CldMicro and CldComp variables is SizeRange. SizeRange delineates the range of measured droplet sizes, which can be categorized as either droplets (“Drop”), precipitation (“Precip”), or “Bulk”. When “Bulk” is used, the accompanying SizingTechnique must be “None”. Table 4.4.2 specifies the SizeRange for each of these ranges.

Table 4.4.2: Specification of Cloud Droplet Size Ranges

SizeRange	**Description**
Drop	Droplet size range: 2-50 um diameter
Precip	Precipitation size range: greater than 50 um diameter
Bulk	No distinction in size of droplet being measured
XtoY	Size Range from X to Y, e.g., DroptoPrecip

Cloud optical properties are functions of wavelengths of light. Therefore, a measurement of cloud optical properties is made at a specific wavelength. Table 4.4.3 lists the WL DescriptiveAttributes specifying the wavelength ranges within which instruments commonly operate.

Table 4.4.3: List Wavelength Ranges for Cloud Optical Property Measurements

WL Attributes	**Description**
UV	Ultraviolet: 10- 400 nm
Blue	440 - 490 nm
Green	490 - 570 nm
Red	620 - 700 nm
IR	Infrared: 700 - 10^6 nm
XtoY	Ratio of a measurement at X wavelength to the same measurement at Y wavelength. E.g., fromBluetoRed

Table 4.4.4: Reporting Attribute Values for Cloud Measurements

Reporting	**Description**
MassSTP	Mass concentration reported at standard temperature and pressure
MassAMB	Mass concentration reported at ambient temperature and pressure
MassFrac	Mass Fraction - Ratio of a constituent mass to the total aerosol mass concentration
NumFrac	Number Fraction - Ratio of a constituent number to the total aerosol number concentration
STP	Aerosol properties reported at standard temperature and pressure
AMB	Aerosol properties reported at ambient temperature and pressure
None	For dimensionless variables

Cloud Variables for Microphysical Properties:
CldMicro_CoreName_MeasurementMode_SizingTechnique_SizeRange_Reporting

MeasurementMode = InSitu, VertColumn, SlantCol, Profl
SizingTechnique = Imaging, Optical, None
SizeRange = Drop, Precip, Bulk, None
Reporting = STP, AMB, None

Example of an in-situ measurement of cloud particle number size distribution derived from an optical sizing technique measuring droplets being reported at ambient conditions:
CldMicro_NumSizeDist_InSitu_Optical_Drop_AMB

Cloud Variables for Chemical Composition:
CldComp_CoreName_MeasurementMode_SizingTechnique_SizeRange_Reporting
MeasurementMode = InSitu
SizingTechnique = Imaging, Optical, None
SizeRange = Drop, Precip, Bulk
Reporting = MassSTP, MassAMB, MassFrac, NumFrac

Example of an in-situ measurement of the mass concentration of sodium derived from a chemical technique measuring droplets reported at ambient conditions:
CldComp_Sodium_InSitu_None_Bulk_MassAMB

Cloud Variables for Optical Properties:
CldOpt_CoreName_MeasurementMode_WL
MeasurementMode = InSitu, VertColumn, SlantCol, Profl
WL = UV, Blue, Green, Red, IR, or XtoY (see table 4.4.3)

Example of an in-situ measurement of cloud particle extinction coefficient measured in the blue wavelength: CldOpt_Extinction_InSitu_blue

Cloud Variables for Macrophysical Properties:
CldMacro_CoreName_MeasurementMode_None
MeasurementMode = InSitu, VertColumn, SlantCol, Profl

Example of an in-situ measurement of cloud top height: CldMacro_CTH_InSitu_None

Table 4.4.5: List of CoreNames for Cloud Property Measurements

Measurement Category	**CoreName**	**Definition**
CldMicro	CrossSectionalArea SizeDist	Cloud Particle Cross Section Area Concentration Size Distribution
CldMicro	MassSizeDist	Cloud Particle Mass Concentration Size Distribution
CldMicro	NumSizeDist	Cloud Particle Number Concentration Size Distribution
CldMicro	NumConc	Cloud Particle Number Concentration

Measurement Category	CoreName	Definition
CldMicro	SurfAreaConc	Cloud Particle Surface Area Concentration
CldMicro	VolConc	Cloud Particle Volume Concentration
CldMicro	SurfAreaSizeDist	Cloud Particle Surface Area Concentration Size Distribution
CldMicro	VolSizeDist	Cloud Particle Volume Concentration Size Distribution
CldMicro	MeanSize	Cloud Particle Mean Size (Radius or Diameter)
CldMicro	MedianSize	Cloud Particle Median Size (Radius or Diameter)
CldMicro	MeanVolumeSize	Cloud Particle Mean Size (Radius or Diameter) weighted by Volume
CldMicro	MedianVolumeSize	Cloud Particle Median Size (Radius or Diameter) weighted by Voume
CldMicro	EffSize	Cloud Particle Effective Radius or Diameter
CldMicro	EffVar	Cloud Particle Effective Variance
CldMicro	LWC	Cloud Particle Liquid Water Content
CldMicro	IWC	Cloud Particle Ice Water Content
CldMicro	TWC	Cloud Particle Total Water content
CldMacro	LWP	Liquid Water Path – Column Integrated Liquid Water Content
CldMacro	CTH	Cloud Top Height
CldMacro	CBH	Cloud Bottom Height
CldOpt	Extinction	Cloud Particle Extinction Coefficient
CldOpt	OD	Cloud Optical Depth
CldComp	Sodium	Cloud Water Mass Concentration of Sodium
CldComp	Chloride	Cloud Water Mass Concentration of Chloride
CldComp	Calcium	Cloud Water Mass Concentration of Calcium
CldComp	Ammonium	Cloud Water Mass Concentration of Ammonium
CldComp	Potassium	Cloud Water Mass Concentration of Potassium
CldComp	Magnesium	Cloud Water Mass Concentration of Magnesium
CldComp	Sulfate	Cloud Water Mass Concentration of Sulfate

Measurement Category	CoreName	Definition
CldComp	Nitrate	Cloud Water Mass Concentration of Nitrate
CldComp	Oxalate	Cloud Water Mass Concentration of Oxalate
CldComp	WSOC	Cloud Water Mass Concentration of Water Soluble Organic Carbon

4.5 Meteorology Standard Names:

The "MeasurementCategory" for meteorology parameters is Met. CoreNames for meteorology variables are listed in Table 4.5. There are no DescriptiveAttributes associated with meteorology variables (i.e., DescriptiveAttributes = None).

Meteorology Parameters:
Met_CoreName_MeasurementMode_None
MeasurementMode = InSitu, VertColumn, SlantCol, Profile

Example of an in-situ measurement of static temperature: Met_StaticTemperature_InSitu_None

Table 4.5: List of CoreNames for Meteorological Measurements

CoreName	Definition
StaticPressure	Ambient Atmospheric Pressure
StaticAirTemperature	Ambient air temperature
PotentialTemperature	Potential temperature
DewPoint	Temperature to which Air Must be Cooled to Become Saturated with Respect to Liquid Water (or Frost)
PartialPressureH2O	Water vapor partial pressure
H2OMRV	Volumetric water vapor mixing ratio
H2OMR	Mass ratio of water vapor to dry air mass
H2OdD	Deviations in the D/H Stable Hydrogen Isotope Ratio relative to H_2O vapor
H2Od18O	Deviations in the $^{18}O/^{16}O$ Stable Oxygen Isotope Ratio relative to H_2O vapor
H2OTotalDMR	Mass mixing ratio of total water (vapor + liquid + ice) over dry air
VWP	Vapor Water Path – column integrated water vapor content

CoreName	Definition
SpecificHumidity	Ratio of the mass of water vapor to the total mass of air (ambient air)
VaporDensity	Absolute Humidity: Ratio of the mass of water vapor present to the volume occupied by ambient air
RelativeHumidityIce	Relative Humidity over Ice
RelativeHumidityWater	Relative Humidity over Water
SatVaporPressureH2OIce	Saturation Vapor Pressure over Ice
SatVaporPressureH2OWater	Saturation Vapor Pressure over liquid Water
SufaceTemperature	IR measurement of temperature of large-area of subjects, e.g., Sea or other large water surface, cloud, or terrain
UWindSpeed	E-W Horizontal Wind Speed
VWindSpeed	N-S Horizontal Wind Speed
WWindSpeed	Vertical Wind Speed
UstdWindSpeed	Standard deviation of E-W Horizontal Wind Speed
VstdWindSpeed	Standard deviation of N-S Horizontal Wind Speed
WstdWindSpeed	Standard deviation of Vertical Wind Speed
WindSpeed	Scalar Wind Speed
WindDirection	Wind Direction, positive North
SolarAzimuthAngle	Solar Azimuth Angle
SolarZenithAngle	Solar Zenith Angle
Ustar	Friction Velocity
Wstar	Convective Velocity Scale
TEDR	Turbulent Dissipation Rate
REYN	Reynolds Number
LHF	Latent Heat Flux
Lobukhov	Obukhov length
BoundaryLayerHeight	Height of planetary boundary layer defined by constant potential temperature
BufferLayerHeight	Height of Buffer Layer typically marked by a distinct temperature inversion
Insolation	Amount of solar radiation reaching the Earth’s surface

CoreName	Definition
RainAccumulation	The cumulative amount of rain over a defined period of time
RainDuration	The period of time in which continuous rainfall is observed
RainRate	The intensity of rain over a specified interval of time
HailAccumulation	The cumulative amount of hail over a defined period of time
HailDuration	The period of time in which continuous hail is observed
HailRate	The intensity of hail over a specified interval of time

4.6 Platform Navigation and Attitude Standard Names:

This group of standard names is for variables describing measurement platform (e.g., aircraft, ship, and motor vehicles) location and attitude (if applicable) as a function of sampling time. The value of MeasurementCategory for this group is “Platform”. CoreNames for navigation variables are listed in Table 4.6. There is no need for further description (i.e., DescriptiveAttributes always has the value of “None”), and the MeasurementMode is always “InSitu”.

Platform Navigation:
Platform_CoreName_MeasurementMode_None
MeasurementMode = InSitu

Example of an in-situ measurement for aircraft Yaw angle: Platform_YawAngle_InSitu_None

Table 4.6: List of CoreNames for Measurement Platform Navigation and Attitude

CoreName	Description
Latitude	The angle between the equatorial plane and the straight line that passes through a point of interest and through (or close to) the center of the Earth
Longitude	The angle east or west of a reference meridian to another meridian that passes through a point of interest
AltitudePressure	Elevation above a standard datum air-pressure plane
AltitudeAGL	Height above ground level
AltitudeMSL	Height above mean sea surface level
AltitudeEllipsoid	Height above Ellipsoid**

CoreName	Description
AltitudeGeoid	Height about Geoid
HeadingTrue	Direction of nose orientation, positive cardinal north
HeadingMagnetic	Direction of nose orientation, positive magnetic north
TrackAngle	Vehicle track over ground reference, positive cardinal north
DriftAngle	Angle difference between HeadingTrue and TrackAngle
PitchAngle	Angle between horizontal axis and the longitudinal axis of the vehicle, positive nose up
RollAngle	Angle between horizontal axis and the lateral axis of the vehicle, positive right wing down
YawAngle	Angle about a vertical axis between vehicle longitudinal axis and the direction of motion of the vehicle, positive right
AngleofAttack	Angle between the chord line of the aircraft and the relative wind
AircraftTrueAirSpeed	Speed of air flow with respect to the aircraft
GroundSpeed	Horizontal speed of vehicle with respect to the earth's surface
AircraftIndicatedAirSpeed	Derived vehicle speed from pitot-static system components (Static and Impact pressure)

** Reference ellipsoid should be defined in variable long name and/or in file header

4.7 Photolysis Rate Standard Names:

The MeasurementCategory for photolysis rate variables is either GasJvalue for gas phase photolysis or AquJvalue for aqueous phase photolysis processes. The CoreNames for the photolysis rates (Table 4.7) consist of "j" plus the CoreName of the gas phase reactants previously given in Table 4.2.2. There are no aqueous phase photolysis rate coefficient measurements from current airborne field studies. The MeasurementMode is "InSitu". Three DescriptiveAttributes are associated with the photolysis variables: "MeasurementDirection", "SpectralCoverage", and "Products". MeasurementDirection describes if the photolysis rates are derived from downwelling, upwelling, or total (Downwelling and Upwelling) actinic flux measurements. SpectralCoverage indicates whether the spectral range of the measurement spans the entire range of photolysis or only a partial range (e.g., UV/Visible range only), and Products

is used to list the products from photolysis reactions, separated by a hyphen ("-"). If no specific products are identified in the photolysis reaction, "Products" should have the value of "NoProductsSpecified".

Photolysis Rates:
MeasurementCategory_CoreName_MeasurementMode_MeasurementDirection_SpectralCoverage_Products
MeasurementCategory = GasJvalue or AquJvalue
MeasurementMode = InSitu
MeasurementDirection = Downwelling, Upwelling, or Total
SpectralCoverage = Partial, Full

Example of photolysis rate coefficient for reaction NO2 + hv → NO + O(3P) derived from total actinic flux measurement:
GasJvalue_jNO2_InSitu_Total_Full_NO2-O3P

Example of photolysis rate coefficient for reaction CHBr3 + hv → products derived from downwelling actinic flux measurement:
GasJvalue_jCHBr3_InSitu_Downwelling_Full_NoProductsSpecified

Example of photolysis rate coefficient for reaction HNO4 + hv → HO2 + NO2 derived from total actinic flux measurement:
GasJvalue_jHNO4_InSitu_Total_Partial_HO2-NO2

Table 4.7: List of CoreNames for Gas Phase Photolytic Rate Coefficients

CoreName	**Definition**
jO3	Rate Coefficient for Photolysis of Ozone
jNO2	Rate Coefficient for Photolysis of Nitrogen Dioxide
jH2O2	Rate Coefficient for Photolysis of Hydrogen Peroxide
jNO3	Rate Coefficient for Photolysis of Nitrate Radical
jN2O5	Rate Coefficient for Photolysis of Nitrogen Pentoxide
jHNO2	Rate Coefficient for Photolysis of Nitrous Acid
jHNO3	Rate Coefficient for Photolysis of Nitric Acid
jHNO4	Rate Coefficient for Photolysis of Peroxynitric acid
jCH2O	Rate Coefficient for Photolysis of Formaldehyde
jCH3CHO	Rate Coefficient for Photolysis of Acetaldehyde
jPropanal	Rate Coefficient for Photolysis of Propanal
jCH3OOH	Rate Coefficient for Photolysis of Methyl Hydroperoxide

CoreName	Definition
jMeONO2	Rate Coefficient for Photolysis of Methyl Nitrate
jEthONO2	Rate Coefficient for Photolysis of Ethyl Nitrate
jPAN	Rate Coefficient for Photolysis of Peroxyacetyl Nitrate
jMAC	Rate Coefficient for Photolysis of Methacrolein
jMVK	Rate Coefficient for Photolysis of Methyl Vinyl Ketone
jMEK	Rate Coefficient for Photolysis of Methyl Ethyl Ketone
jAcetone	Rate Coefficient for Photolysis of Acetone
jEthAcetate	Rate Coefficient for Photolysis of Ethyl Acetate
jMeAcetate	Rate Coefficient for Photolysis of Methyl Acetate
jCHOCHO	Rate Coefficient for Photolysis of Glyoxal
jCH3COCHO	Rate Coefficient for Photolysis of Methyl Glyoxal
j23Butanedione	Rate Coefficient for Photolysis of 2,3-Butanedione
jCl2	Rate Coefficient for Photolysis of Chlorine
jClO	Rate Coefficient for Photolysis of Chlorine Oxide
jClNO2	Rate Coefficient for Photolysis of Nitryl Chloride
jClONO	Rate Coefficient for Photolysis of ClONO
jClONO2	Rate Coefficient for Photolysis of Chlorine Nitrate
jBr2	Rate Coefficient for Photolysis of Bromine to Br+Br
jBrO	Rate Coefficient for Photolysis of Bromine Oxide
jHOBr	Rate Coefficient for Photolysis of Hypobromous Acid
jBrNO	Rate Coefficient for Photolysis of BrNO
jBrONO	Rate Coefficient for Photolysis of BrONO
jBrONO2	Rate Coefficient for Photolysis of BrONO2
jBrNO2	Rate Coefficient for Photolysis of BrNO2
jBrCl	Rate Coefficient for Photolysis of Bromine Chloride
jCHBr3	Rate Coefficient for Photolysis of Bromoform
jButanal	Rate Coefficient for Photolysis of Butanal
jBr2O	Rate Coefficient for Photolysis of Dibromine Monoxide

CoreName	Definition
jHydroxyacetone	Rate Coefficient for Photolysis of Hydroxyacetone

4.8 Radiation Standard Names:

The “Rad” MeasurementCategory is a group of standard names that describe radiation measurement variables. The MeasurementMode for this category is always “InSitu”, and possible CoreNames are given in Table 4.8. There is only one DescriptiveAttribute, “WLMode”, which refers to the spectral measurement mode. WLmode may be three options: “BB” for broadband measurements, “SP” for spectral measurements, and “SC” for measurement-specific spectral channels. While measurement spectral range is important, fully describing it requires specific wavelength information, which is beyond the scope of the broad ranges and controlled vocabulary of standard names. Specific spectral range information should be given in the variable description, e.g., in the long variable name in the ICARTT format.

Radiation Measurements:
Standard Name = Rad_CoreName_InSitu_WLMode
WLMode = BB (broadband), SP (spectral), or SC (specific channels)

Example of an in-situ measurement of Downwelling Diffuse Broadband Solar Irradiance between 0.2 and 3.6 micron: Rad_IrradianceDownwellingDiffuse_InSitu_BB

Table 4.8: List of CoreNames for Radiation Measurements

CoreName	Definition
Radiance	Radiant flux emitted, reflected, transmitted or received by a surface, per unit solid angle per unit projected area
IrradianceDownwellingDirect	Radiant flux received by a surface per unit area, i.e., downwelling direct component of irradiance
IrradianceDownwellingDiffuse	Radiant flux received by a surface per unit area, i.e., downwelling diffuse component of irradiance
IrradianceDownwellingGlobal	Radiant flux received by a surface per unit area, i.e., downwelling global (diffuse and direct) irradiance
IrradianceUpwelling	Radiant flux received by a surface per unit area (upwelling)
ActinicFlux	Spherically integrated solar radiation flux in the earth's atmosphere