

# Atmospheric Composition Variable Standard Name Recommendations

*(Ver. 19, October 15, 2021)*

## 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 data product 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 suborbital field studies on atmospheric composition.

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

Standard Name = `MeasurementCategory_CoreName_AcquisitionMethod_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, interoperability, 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. The `DescriptiveAttributes` can also provide additional description necessary for research use of data. The `AcquisitionMethod` identifies the sampling technique used for the measurement.

### 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 or aerosol particles). 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 particle optical property vs. aerosol particle composition) or medium (e.g., trace gas vs. aerosol particle); therefore, `MeasurementCategory` is defined by the measurement medium and type of measurements. See Table 1 for the complete list of `MeasurementCategories`. The variable standard names for each `MeasurementCategory` are introduced in Section 2.

Table 1: List of Values for MeasurementCategory

MeasurementCategory	Description	Number of Descriptive Attributes
Gas	Trace gases properties, e.g., abundance and isotope ratios	2
AerComp	Aerosol particle composition	3
AerMP	Aerosol particle microphysical properties	4
AerOpt	Aerosol particle optical properties	4
CldComp	Cloud particle composition	3
CldMicro	Cloud particle microphysical properties	3
CldMacro	Cloud macrophysical properties	0*
CldOpt	Cloud optical properties	1
Met	Meteorology parameters	0*
GasJValue	Gas phase photolytic rate coefficients	3
AquJValue	Aqueous phase photolytic rate 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.

### 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”.

### 1.3 AcquisitionMethod

The AcquisitionMethod 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 2.

Table 2: List of Values for AcquisitionMethod

AcquisitionMethod	Description
InSitu	Sampling in close proximity of the instrument or the sampling platform
VertCol	Measurement of a remotely sensed vertically integrated column, where the column measured is nominally perpendicular to the earth's surface
SlantCol	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

#### 1.4 DescriptiveAttributes

The descriptive attributes provide measurement and/or data reporting information relevant for data use and faceted data search, 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 for CoreNames and DescriptiveAttributes pertaining to each MeasurementCategory.

## 2 Standard Variable Names

### 2.1 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 3. When reporting in standard temperature and pressure (STP), the temperature and pressure conditions under which the measurement is reported must be noted in the header or metadata of the data file, as "standard temperature" varies across the research community.

Table 3: 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 $^{13}\text{C}/^{12}\text{C}$ Stable Carbon Isotope Ratio relative to a standard
d14C	Deviations in the $^{14}\text{C}/^{12}\text{C}$ 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 $^{18}\text{O}/^{16}\text{O}$ Stable Oxygen Isotope Ratio relative to a standard

The CoreNames for trace gas measurements are given in Table 4. 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., NO<sub>y</sub>, PN<sub>s</sub>) 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 AcquisitionMethod, MeasurementSpecificity, and Reporting attribute that can be used in a trace gas standard name.

### **Trace Gases**

Gas\_CoreName\_AcquisitionMethod\_MeasurementSpecificity\_Reporting

AcquisitionMethod = InSitu, VertCol, SlantCol, Profile

MeasurementSpecificity = S (single species), M (multiple species), NA (not applicable)

Reporting = DVMR, AVMR, DMF, AMF, ConcSTP, ConcAMB, CNDAMB, d13C, d14C, dD, 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 provides a list of trace gas CoreNames, along with definition, chemical formula, CAS number, and MeasurementSpecificity. For convenience, 7 subgroups are used to categorize the variables: Oxygen Species, Hydrogen Species and Radicals; Nitrogen Species; Sulfur Species; Halogens and Halogenates; Hydrocarbons: Alkanes, Alkenes, and Alkynes; Hydrocarbons: Aromatics; and Oxygenated Inorganic and Volatile Organic Carbon Species, similar to the terms used in the Global Change Master Directory (GCMD).

Table 4: List of Trace Gas CoreNames and Definitions

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
<b>Oxygen Species, Hydrogen Species and Radicals</b>				
H2	Hydrogen	H2	1333-74-0	S
O2	Oxygen	O2	7782-44-7	S
O2toN2ratio	Ratio of Oxygen to Nitrogen	N/A	N/A	NA
APO	Atmospheric Potential Oxygen (O2 + 1.1 x (CO2 - 350))	N/A	N/A	NA
HO2	Hydroperoxy radical	HO2	3170-83-0	S
CH3O2	Methylperoxy radical	CH3O2	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

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
H2O2	Hydrogen peroxide	H2O2	7722-84-1	S
O3	Ozone	O3	10028-15-6	S
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	CH3	2229-07-4	S
CH3O	Methoxy radical	CH3O	2143-68-2	S
C2H5O	Ethoxy radical	C2H5O	2154-50-9	S
CH3COO2	Peroxyacetyl radical	C2H3O3	36709-10-1	S
CH3COO	Acetoxy radical	C2H3O2	N/A	S
CH3CH2	Ethyl radical	C2H5	2025-56-1	S
CH3CO	Acetyl radical	C2H3O	3170-69-2	S
<b>Nitrogen Species</b>				
NH3	Ammonia	NH3	7664-41-7	S
NF3	Nitrogen trifluoride	NF3	7783-54-2	S
N2O	Nitrous oxide	N2O	10024-97-2	S
NO	Nitric oxide	NO	10102-43-9	S
NO2	Nitrogen dioxide	NO2	10102-44-0	S
NO3	Nitrate radical	NO3	12033-49-7	S
N2O5	Nitrogen pentoxide	N2O5	10102-03-01	S
HNO2	Nitrous acid	HNO2	7782-77-6	S
HNO3	Nitric acid	HNO3	7697-37-2	S
HNO4	Peroxynitric acid	HNO4	26404-66-0	S
HCN	Hydrogen cyanide	HCN	74-90-8	S
CH3CN	Acetonitrile	C2H3N	75-05-8	S

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
HNCO	Isocyanic acid	HNCO	75-13-8	S
Acrylonitrile	Acrylonitrile	C <sub>3</sub> H <sub>3</sub> N	107-13-1	S
MeAcrylonitrile	Methylacrylonitrile	C <sub>4</sub> H <sub>5</sub> N	126-98-7	S
PropNitrile	Propanenitrile	C <sub>3</sub> H <sub>5</sub> N	107-12-0	S
BenzNitrile	Benzenenitrile	C <sub>7</sub> H <sub>5</sub> N	100-47-0	S
Pyrrole	Pyrrole	C <sub>4</sub> H <sub>5</sub> N	109-97-7	S
C <sub>4</sub> H <sub>5</sub> N	Sum of C <sub>4</sub> H <sub>5</sub> N isomers	C <sub>4</sub> H <sub>5</sub> N	N/A	M
Pyridine	Pyridine	C <sub>5</sub> H <sub>5</sub> N	110-86-1	S
Nitromethane	Nitromethane	CH <sub>3</sub> NO <sub>2</sub>	75-52-5	S
ClNO <sub>2</sub>	Nitryl chloride	ClNO <sub>2</sub>	13444-90-1	S
ClONO <sub>2</sub>	Chlorine nitrate	ClNO <sub>3</sub>	14545-72-3	S
MeONO <sub>2</sub>	Methyl nitrate	CH <sub>3</sub> NO <sub>3</sub>	598-58-3	S
EthONO <sub>2</sub>	Ethyl nitrate	C <sub>2</sub> H <sub>5</sub> NO <sub>3</sub>	625-58-1	S
nPropONO <sub>2</sub>	n-Propyl nitrate	C <sub>3</sub> H <sub>7</sub> NO <sub>3</sub>	627-13-4	S
iPropONO <sub>2</sub>	Isopropyl nitrate	C <sub>3</sub> H <sub>7</sub> NO <sub>3</sub>	1712-64-7	S
nButONO <sub>2</sub>	n-Butyl nitrate	C <sub>4</sub> H <sub>9</sub> NO <sub>3</sub>	928-45-0	S
x2ButONO <sub>2</sub>	2-Butyl nitrate	C <sub>4</sub> H <sub>9</sub> NO <sub>3</sub>	924-52-7	S
iButONO <sub>2</sub>	Isobutyl nitrate	C <sub>4</sub> H <sub>9</sub> NO <sub>3</sub>	543-29-3	S
iButONO <sub>2</sub> and2ButONO <sub>2</sub>	Sum of Isobutyl nitrate and 2-Butyl nitrate	C <sub>4</sub> H <sub>9</sub> NO <sub>3</sub>	N/A	M
tButONO <sub>2</sub>	t-Butyl nitrate	C <sub>4</sub> H <sub>9</sub> NO <sub>3</sub>	0926-05-06	S
nPentONO <sub>2</sub>	n-Pentyl nitrate	C <sub>5</sub> H <sub>11</sub> NO <sub>3</sub>	1002-16-0	S
x2PentONO <sub>2</sub>	2-Pentyl nitrate	C <sub>5</sub> H <sub>11</sub> NO <sub>3</sub>	21981-48-6	S
x3PentONO <sub>2</sub>	3-Pentyl nitrate	C <sub>5</sub> H <sub>11</sub> NO <sub>3</sub>	N/A	S
iPentONO <sub>2</sub>	Isopentyl nitrate	C <sub>5</sub> H <sub>11</sub> NO <sub>3</sub>	543-87-3	S
x3Me2ButONO <sub>2</sub>	3-Methyl-2-butyl nitrate	C <sub>5</sub> H <sub>11</sub> NO <sub>3</sub>	N/A	S
x2OxoEthONO <sub>2</sub>	2-Oxoethyl nitrate	C <sub>2</sub> H <sub>3</sub> NO <sub>4</sub>	72673-15-5	S
AcetylONO <sub>2</sub>	Acetyl nitrate	C <sub>2</sub> H <sub>3</sub> NO <sub>4</sub>	591-09-3	S

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
PAN	Peroxyacetyl nitrate	C <sub>2</sub> H <sub>3</sub> NO <sub>5</sub>	2278-22-0	S
APAN	Peroxyacryloyl nitrate	C <sub>3</sub> H <sub>3</sub> NO <sub>5</sub>	N/A	S
PPN	Peroxypropionyl nitrate	C <sub>3</sub> H <sub>5</sub> NO <sub>5</sub>	5796-89-4	S
PBN	Peroxybutyryl nitrate	C <sub>4</sub> H <sub>7</sub> NO <sub>5</sub>	N/A	S
PiBN	Peroxyisobutyric nitrate	C <sub>4</sub> H <sub>7</sub> NO <sub>5</sub>	N/A	S
PPeN	Peroxypentyl nitrate	C <sub>5</sub> H <sub>9</sub> NO <sub>5</sub>	N/A	M
PBzN	Peroxybenzoyl nitrate	C <sub>7</sub> H <sub>5</sub> NO <sub>5</sub>	N/A	S
MoPN	Methoxy Peroxyacetyl nitrate	C <sub>2</sub> H <sub>6</sub> NO <sub>6</sub>	N/A	S
MPAN	Peroxymethacryloyl nitrate	C <sub>4</sub> H <sub>5</sub> NO <sub>5</sub>	N/A	S
PNs	Sum of Peroxynitrates	N/A	N/A	M
ANs	Sum of Akylnitrates	N/A	N/A	M
NO <sub>x</sub>	Nitrogen oxides (NO + NO <sub>2</sub> )	N/A	N/A	M
NO <sub>y</sub>	Total Reactive Nitrogen	N/A	N/A	M
NO <sub>y</sub> asNO <sub>2</sub>	Total Reactive Nitrogen Converted to NO <sub>2</sub>	N/A	N/A	M
NO <sub>y</sub> asNO	Total Reactive Nitrogen Converted to NO	N/A	N/A	M
x2HydEthONO <sub>2</sub>	2-Hydroxyethyl nitrate	C <sub>2</sub> H <sub>5</sub> NO <sub>4</sub>	16051-48-2	S
C <sub>3</sub> H <sub>7</sub> NO <sub>4</sub>	Sum of C <sub>3</sub> H <sub>7</sub> NO <sub>4</sub> Hydroxy nitrates	C <sub>3</sub> H <sub>7</sub> NO <sub>4</sub>	N/A	M
C <sub>3</sub> H <sub>5</sub> NO <sub>4</sub>	Sum of C <sub>3</sub> H <sub>5</sub> NO <sub>4</sub> Carbonyl nitrates	C <sub>3</sub> H <sub>5</sub> NO <sub>4</sub>	N/A	M
C <sub>4</sub> H <sub>7</sub> NO <sub>4</sub>	Sum of C <sub>4</sub> H <sub>7</sub> NO <sub>4</sub> Isomers	C <sub>4</sub> H <sub>7</sub> NO <sub>4</sub>	N/A	M
C <sub>4</sub> H <sub>7</sub> NO <sub>5</sub>	Sum of Isomers, including C <sub>4</sub> Hydroxy Carbonyl Nitrates	C <sub>4</sub> H <sub>7</sub> NO <sub>5</sub>	N/A	M
C <sub>4</sub> H <sub>9</sub> NO <sub>4</sub>	Sum of C <sub>4</sub> H <sub>9</sub> NO <sub>4</sub> Hydroxy nitrates	C <sub>4</sub> H <sub>9</sub> NO <sub>4</sub>	N/A	M
ISOPN	Sum of Isoprene Hydroxy Nitrate Isomers	C <sub>5</sub> H <sub>9</sub> NO <sub>4</sub>	N/A	M
C <sub>5</sub> H <sub>9</sub> NO <sub>5</sub>	Sum of C <sub>5</sub> H <sub>9</sub> NO <sub>5</sub> Isomers, including Hydroperoxy Nitrates of Isoprene	C <sub>5</sub> H <sub>9</sub> NO <sub>5</sub>	N/A	M



<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
NitroCatechol	Nitrocatechol, aka 4-nitrocatechol	C <sub>6</sub> H <sub>5</sub> NO <sub>4</sub>	3316-09-04	S
NitroGuaiacol	Nitroguaiacol, including 4-Nitroguaiacol and 5-Nitroguaiacol	C <sub>7</sub> H <sub>7</sub> NO <sub>4</sub>	N/A	M
x4NitroGuaiacol	4-Nitroguaiacol	C <sub>7</sub> H <sub>7</sub> NO <sub>4</sub>	3251-56-7	S
x5NitroGuaiacol	5-Nitroguaiacol	C <sub>7</sub> H <sub>7</sub> NO <sub>4</sub>	636-93-1	S
<b>Sulfur Species</b>				
CS <sub>2</sub>	Carbon disulfide	CS <sub>2</sub>	75-15-0	S
CH <sub>3</sub> SH	Methanethiol	CH <sub>4</sub> S	74-93-1	S
DMS	Dimethyl sulfide	C <sub>2</sub> H <sub>6</sub> S	75-18-3	S
DMDS	Dimethyl disulfide	C <sub>2</sub> H <sub>6</sub> S <sub>2</sub>	624-92-0	S
DMSO	Dimethyl sulfoxide	(CH <sub>3</sub> ) <sub>2</sub> SO	67-68-5	S
DMSO <sub>2</sub>	Dimethyl sulfone	(CH <sub>3</sub> ) <sub>2</sub> SO <sub>2</sub>	67-71-0	S
H <sub>2</sub> SO <sub>4</sub>	Sulfuric acid	H <sub>2</sub> SO <sub>4</sub>	7664-93-9	S
MSA	Methanesulfonic acid	CH <sub>4</sub> O <sub>3</sub> S	75-75-2	S
OCS	Carbonyl sulfide	OCS	463-58-1	S
SF <sub>6</sub>	Sulfur hexafluoride	SF <sub>6</sub>	2551-62-4	S
C <sub>2</sub> H <sub>4</sub> O <sub>3</sub> S	Sum of C <sub>2</sub> H <sub>4</sub> O <sub>3</sub> S isomers	C <sub>2</sub> H <sub>4</sub> O <sub>3</sub> S	N/A	M
SO <sub>2</sub> F <sub>2</sub>	Sulfuryl fluoride	SO <sub>2</sub> F <sub>2</sub>	2699-79-8	S
SO <sub>2</sub>	Sulfur dioxide	SO <sub>2</sub>	7446-09-05	S
HPMTF	Hydroperoxymethyl thioformate	HOOCH <sub>2</sub> SCHO	N/A	S
<b>Halogens and Halogenates</b>				
Cl	Chlorine atom	Cl	22537-15-1	S
HCl	Hydrogen chloride	HCl	7647-01-0	S
Cl <sub>2</sub>	Chlorine	Cl <sub>2</sub>	7782-50-5	S
ClO	Chlorine monoxide	ClO	14989-30-1	S

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
HOCl	Hypochlorous acid	HOCl	7790-92-3	S
Br	Bromine atom	Br	10097-32-2	S
HBr	Hydrogen bromide	HBr	10035-10-6	S
Br2	Bromine	Br2	7726-95-6	S
BrCl	Bromine chloride	BrCl	13863-41-7	S
BrO	Bromine monoxide	BrO	15656-19-6	S
BrONO	Bromine nitrite	BrNO <sub>2</sub>	N/A	S
BrONO <sub>2</sub>	Bromine nitrate	BrNO <sub>3</sub>	40423-14-1	S
BrNO <sub>2</sub>	Bromine nitrite	BrNO <sub>2</sub>	N/A	S
HOBr	Hypobromous acid	HOBr	13517-11-8	S
Br <sub>2</sub> HOBr	Sum of HOBr and Br <sub>2</sub>	N/A	N/A	M
Br <sub>2</sub> O	Dibromine monoxide	Br <sub>2</sub> O	21308-80-5	S
BrCN	Cyanogen Bromide	BrCN	506-68-3	S
I	Iodine atom	I	14362-44-8	S
I <sub>2</sub>	Iodine	I <sub>2</sub>	7553-56-2	S
IO	Iodine monoxide	IO	14696-98-1	S
HOI	Hypoiodous acid	HIO	14332-21-9	S
CH <sub>3</sub> COOCl	Chloroacetic acid	C <sub>2</sub> H <sub>3</sub> ClO <sub>2</sub>	79-11-8	S
CH <sub>3</sub> Cl	Chloromethane	CH <sub>3</sub> Cl	74-87-3	S
CH <sub>2</sub> Cl <sub>2</sub>	Dichloromethane	CH <sub>2</sub> Cl <sub>2</sub>	75-09-2	S
CHCl <sub>3</sub>	Chloroform	CHCl <sub>3</sub>	67-66-3	S
CCl <sub>4</sub>	Tetrachloromethane	CCl <sub>4</sub>	56-23-5	S
C <sub>2</sub> H <sub>5</sub> Cl	Chloroethane	C <sub>2</sub> H <sub>5</sub> Cl	75-00-3	S
CH <sub>3</sub> CHCl <sub>2</sub>	1,1-Dichloroethane	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	75-34-3	S
CH <sub>2</sub> ClCH <sub>2</sub> Cl	1,2-Dichloroethane	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	0107-06-02	S
CH <sub>3</sub> CCl <sub>3</sub>	Methyl chloroform; 1,1,1-Trichloroethane	C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub>	71-55-6	S
CHCl <sub>2</sub> CH <sub>2</sub> Cl	1,1,2-Trichloroethane	C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub>	79-00-5	S

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
CHCl <sub>2</sub> CHCl <sub>2</sub>	1,1,2,2-Tetrachloroethane	C <sub>2</sub> H <sub>2</sub> Cl <sub>4</sub>	79-34-5	S
C <sub>2</sub> H <sub>3</sub> Cl	Chloroethene	C <sub>2</sub> H <sub>3</sub> Cl	75-01-4	S
tCHClCHCl	trans-1,2-Dichloroethene	C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub>	156-60-5	S
cCHClCHCl	cis-1,2-Dichloroethene	C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub>	156-59-2	S
CCl <sub>2</sub> CH <sub>2</sub>	1,1-Dichloroethene	C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub>	75-35-4	S
C <sub>2</sub> HCl <sub>3</sub>	Trichloroethene	C <sub>2</sub> HCl <sub>3</sub>	79-01-6	S
C <sub>2</sub> Cl <sub>4</sub>	Tetrachloroethene	C <sub>2</sub> Cl <sub>4</sub>	127-18-4	S
x12DiClPropane	1,2-Dichloropropane	C <sub>3</sub> H <sub>6</sub> Cl <sub>2</sub>	78-87-5	S
x123TriClPropane	1,2,3-Trichloropropane	C <sub>3</sub> H <sub>5</sub> Cl <sub>3</sub>	96-18-4	S
x13DiClPropene	1,3-Dichloropropene	C <sub>3</sub> H <sub>4</sub> Cl <sub>2</sub>	542-75-6	S
x23DiCl1Propene	2,3-Dichloro-1-propene	C <sub>3</sub> H <sub>4</sub> Cl <sub>2</sub>	78-88-6	S
hexClButadiene	Hexachlorobutadiene	C <sub>4</sub> Cl <sub>6</sub>	87-68-3	S
ClBenzene	Chlorobenzene	C <sub>6</sub> H <sub>5</sub> Cl	108-90-7	S
pDiClBenzene	1,4-Dichlorobenzene	C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	106-46-7	S
mDiClBenzene	1,3-Dichlorobenzene	C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	541-73-1	S
oDiClBenzene	1,2-Dichlorobenzene-	C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	95-50-1	S
x124TriClBenzene	1,2,4-Trichlorobenzene	C <sub>6</sub> H <sub>3</sub> Cl <sub>3</sub>	120-82-1	S
x123TriClBenzene	1,2,3-Trichlorobenzene	C <sub>6</sub> H <sub>3</sub> Cl <sub>3</sub>	87-61-6	S
x135TriClBenzene	1,3,5-Trichlorobenzene	C <sub>6</sub> H <sub>3</sub> Cl <sub>3</sub>	108-70-3	S
aClToluene	Benzyl chloride	C <sub>7</sub> H <sub>7</sub> Cl	100-44-7	S
oClToluene	1-Chloro-2-methylbenzene	C <sub>7</sub> H <sub>7</sub> Cl	95-49-8	S
pClToluene	1-Chloro-4-methylbenzene	C <sub>7</sub> H <sub>7</sub> Cl	95-49-8	S
mClToluene	1-Chloro-3-methylbenzene	C <sub>7</sub> H <sub>7</sub> Cl	108-41-8	S
CH <sub>3</sub> Br	Bromomethane	CH <sub>3</sub> Br	74-83-9	S
CH <sub>2</sub> Br <sub>2</sub>	Dibromomethane	CH <sub>2</sub> Br <sub>2</sub>	74-95-3	S
CHBr <sub>3</sub>	Bromoform	CHBr <sub>3</sub>	75-25-2	S
C <sub>2</sub> H <sub>5</sub> Br	Bromoethane	C <sub>2</sub> H <sub>5</sub> Br	74-96-4	S
CH <sub>2</sub> BrCH <sub>2</sub> Br	1,2-Dibromoethane	C <sub>2</sub> H <sub>4</sub> Br <sub>2</sub>	106-93-4	S

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
nC3H7Br	n-Propyl bromide	C <sub>3</sub> H <sub>7</sub> Br	106-94-5	S
BrBenzene	Bromobenzene	C <sub>6</sub> H <sub>5</sub> Br	108-86-1	S
CH <sub>3</sub> I	Iodomethane	CH <sub>3</sub> I	74-88-4	S
CH <sub>2</sub> I <sub>2</sub>	Diiodomethane	CH <sub>2</sub> I <sub>2</sub>	75-11-6	S
C <sub>2</sub> H <sub>5</sub> I	Iodoethane	C <sub>2</sub> H <sub>5</sub> I	75-03-6	S
CH <sub>2</sub> BrCl	Bromochloromethane	CH <sub>2</sub> BrCl	74-97-5	S
CHBr <sub>2</sub> Cl	Dibromochloromethane	CHBr <sub>2</sub> Cl	124-48-1	S
CHBrCl <sub>2</sub>	Bromodichloromethane	CHBrCl <sub>2</sub>	75-27-4	S
CH <sub>2</sub> BrCHBrCH <sub>2</sub> Cl	1,2-Dibromo-3-chlorobenzene	C <sub>3</sub> H <sub>5</sub> Br <sub>2</sub> Cl	96-12-8	S
CH <sub>2</sub> ClI	Chloriodomethane	CH <sub>2</sub> ClI	593-71-5	S
CH <sub>2</sub> BrI	Bromiodomethane	CH <sub>2</sub> BrI	557-68-6	S
CFC11	Trichlorofluoromethane	CCl <sub>3</sub> F	75-69-4	S
CFC12	Dichlorodifluoromethane	CCl <sub>2</sub> F <sub>2</sub>	75-71-8	S
CFC13	Chlorotrifluoromethane	CClF <sub>3</sub>	75-72-9	S
CF <sub>4</sub>	Tetrafluoromethane	CF <sub>4</sub>	75-73-0	S
CFC112	Tetrachloro-1,2-difluoroethane	C <sub>2</sub> Cl <sub>4</sub> F <sub>2</sub>	76-12-0	S
CFC113	1,1,2-Trichlorotrifluoroethane	C <sub>2</sub> Cl <sub>3</sub> F <sub>3</sub>	76-13-1	S
CFC114	1,2-Dichlorotetrafluoroethane	C <sub>2</sub> Cl <sub>2</sub> F <sub>4</sub>	76-14-2	S
CFC115	Chloropentafluoroethane	C <sub>2</sub> ClF <sub>5</sub>	76-15-3	S
C <sub>2</sub> F <sub>6</sub>	Hexafluoroethane	C <sub>2</sub> F <sub>6</sub>	76-16-4	S
H1202	Dibromodifluoromethane	CBr <sub>2</sub> F <sub>2</sub>	75-61-6	S
H1211	Bromochlorodifluoromethane	CBrClF <sub>2</sub>	353-59-3	S
H1301	Bromotrifluoromethane	CBrF <sub>3</sub>	75-63-8	S
H2402	1,2-Dibromotetrafluoroethane	C <sub>2</sub> Br <sub>2</sub> F <sub>4</sub>	124-73-2	S
HCFC123	1,1-Dichloro-2,2,2-trifluoroethane	C <sub>2</sub> HCl <sub>2</sub> F <sub>3</sub>	306-83-2	S
HCFC124	1-Chloro-1,2,2,2-tetrafluoroethane	C <sub>2</sub> HCIF <sub>4</sub>	2837-89-0	S

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
HCFC141b	1,1-Dichloro-1-fluoroethane	C <sub>2</sub> H <sub>3</sub> Cl <sub>2</sub> F	1717-00-6	S
HCFC142b	1-Chloro-1,1-difluoroethane	C <sub>2</sub> H <sub>3</sub> ClF <sub>2</sub>	75-68-3	S
HCFC133a	1-Chloro-2,2,2-trifluoroethane	C <sub>2</sub> H <sub>2</sub> ClF <sub>3</sub>	75-88-7	S
HCFC21	Dichlorofluoromethane	CHCl <sub>2</sub> F	75-43-4	S
HCFC22	Chlorodifluoromethane	CHClF <sub>2</sub>	75-45-6	S
HFC125	Pentafluoroethane	C <sub>2</sub> HF <sub>5</sub>	354-33-6	S
HFC134a	1,1,1,2-Tetrafluoroethane	C <sub>2</sub> H <sub>2</sub> F <sub>4</sub>	811-97-2	S
HFC143a	1,1,1-Trifluoroethane	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub>	420-46-2	S
HFC152a	1,1-Difluoroethane	C <sub>2</sub> H <sub>4</sub> F <sub>2</sub>	75-37-6	S
C3F8	Octafluoropropane	C <sub>3</sub> F <sub>8</sub>	76-19-7	S
HFC23	Trifluoromethane	CHF <sub>3</sub>	75-46-7	S
HFC227ea	1,1,1,2,3,3,3-Heptafluoropropane	C <sub>3</sub> HF <sub>7</sub>	431-89-0	S
HFC32	Difluoromethane	CH <sub>2</sub> F <sub>2</sub>	75-10-5	S
HFC365mfc	1,1,1,3,3-Pentafluorobutane	C <sub>4</sub> H <sub>5</sub> F <sub>5</sub>	406-58-6	S
HFC236fa	1,1,1,3,3,3-Hexafluoropropane	C <sub>3</sub> H <sub>2</sub> F <sub>6</sub>	690-39-1	S
<b>Hydrocarbons: Alkanes, Alkenes, and Alkynes</b>				
CH <sub>4</sub>	Methane	CH <sub>4</sub>	74-82-8	S
x13CH <sub>4</sub>	<sup>13</sup> CH <sub>4</sub> -Methane	<sup>13</sup> CH <sub>4</sub>	14762-74-4	S
x14CH <sub>4</sub>	<sup>14</sup> CH <sub>4</sub> -Methane	<sup>14</sup> CH <sub>4</sub>	2772-68-1	S
CH <sub>3</sub> D	CH <sub>3</sub> D-Methane	CH <sub>3</sub> D	676-49-3	S
Ethane	Ethane	C <sub>2</sub> H <sub>6</sub>	74-84-0	S
Ethene	Ethene	C <sub>2</sub> H <sub>4</sub>	74-85-1	S
Ethyne	Ethyne	C <sub>2</sub> H <sub>2</sub>	74-86-2	S
Propane	Propane	C <sub>3</sub> H <sub>8</sub>	74-98-6	S
Propene	Propene	C <sub>3</sub> H <sub>6</sub>	0115-07-01	S
Propyne	Propyne	C <sub>3</sub> H <sub>4</sub>	74-99-7	S
Propadiene	Propadiene	C <sub>3</sub> H <sub>4</sub>	463-49-0	S

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
nButane	n-Butane	C <sub>4</sub> H <sub>10</sub>	106-97-8	S
iButane	Isobutane	C <sub>4</sub> H <sub>10</sub>	75-28-5	S
iButene	Isobutene	C <sub>4</sub> H <sub>8</sub>	0115-11-7	S
x1Butene	1-Butene	C <sub>4</sub> H <sub>8</sub>	106-98-9	S
iButene1Butene	Sum of Isobutene and 1-Butene	C <sub>4</sub> H <sub>8</sub>	N/A	M
c2Butene	cis-2-Butene	C <sub>4</sub> H <sub>8</sub>	590-18-1	S
t2Butene	trans-2-Butene	C <sub>4</sub> H <sub>8</sub>	624-64-6	S
CycButane	Cyclobutane	C <sub>4</sub> H <sub>8</sub>	287-23-0	S
x13Butadiene	1,3-Butadiene	C <sub>4</sub> H <sub>6</sub>	106-99-0	S
x12Butadiene	1,2-Butadiene	C <sub>4</sub> H <sub>6</sub>	590-19-2	S
x1Butyne	1-Butyne	C <sub>4</sub> H <sub>6</sub>	107-00-6	S
x2Butyne	2-Butyne	C <sub>4</sub> H <sub>6</sub>	503-17-3	S
x1Buten3yne	1-Buten-3-yne	C <sub>4</sub> H <sub>4</sub>	689-97-4	S
x13Butadiyne	1,3-Butadiyne	C <sub>4</sub> H <sub>2</sub>	460-12-8	S
nPentane	n-Pentane	C <sub>5</sub> H <sub>12</sub>	109-66-0	S
iPentane	Isopentane	C <sub>5</sub> H <sub>12</sub>	78-78-4	S
Neopentane	Neopentane	C <sub>5</sub> H <sub>12</sub>	463-82-1	S
x1Pentene	1-Pentene	C <sub>5</sub> H <sub>10</sub>	109-67-1	S
c2Pentene	cis-2-Pentene	C <sub>5</sub> H <sub>10</sub>	627-20-3	S
t2Pentene	trans-2-Pentene	C <sub>5</sub> H <sub>10</sub>	0646-04-08	S
x2Me1Butene	2-Methyl-1-butene	C <sub>5</sub> H <sub>10</sub>	563-46-2	S
x3Me1Butene	3-Methyl-1-butene	C <sub>5</sub> H <sub>10</sub>	563-45-1	S
x2Me2Butene	2-Methyl-2-butene	C <sub>5</sub> H <sub>10</sub>	513-35-9	S
CycPentane	Cyclopentane	C <sub>5</sub> H <sub>10</sub>	287-92-3	S
CycPentene	Cyclopentene	C <sub>5</sub> H <sub>8</sub>	142-29-0	S
Z13Pentadiene	(Z)-1,3-Pentadiene	C <sub>5</sub> H <sub>8</sub>	1574-41-0	M
E13Pentadiene	(E)-1,3-Pentadiene	C <sub>5</sub> H <sub>8</sub>	2004-70-8	M

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
x13Pentadienes	Sum of (E)-1,3-Pentadiene and (Z)-1,3-Pentadiene	C <sub>5</sub> H <sub>8</sub>	504-60-9	M
Isoprene	Isoprene	C <sub>5</sub> H <sub>8</sub>	78-79-5	S
IsopreneFuran	Sum of Isoprene and Furan	N/A	N/A	M
nHexane	n-Hexane	C <sub>6</sub> H <sub>14</sub>	110-54-3	S
x2MePentane	2-Methylpentane	C <sub>6</sub> H <sub>14</sub>	107-83-5	S
x3MePentane	3-Methylpentane	C <sub>6</sub> H <sub>14</sub>	96-14-0	S
MePentanes	Sum of 2-Methylpentane and 3-Methylpentane	C <sub>6</sub> H <sub>14</sub>	N/A	M
x22DimeButane	2,2-Dimethylbutane	C <sub>6</sub> H <sub>14</sub>	75-83-2	S
x23DimeButane	2,3-Dimethylbutane	C <sub>6</sub> H <sub>14</sub>	79-29-8	S
x1Hexene	1-Hexene	C <sub>6</sub> H <sub>12</sub>	592-41-6	S
x2Me1Pentene	2-Methyl-1-pentene	C <sub>6</sub> H <sub>12</sub>	763-29-1	S
x32Me1Pentene	3-Methyl-1-pentene	C <sub>6</sub> H <sub>12</sub>	760-20-3	S
x4Me1Pentene	4-Methyl-1-pentene	C <sub>6</sub> H <sub>12</sub>	691-37-2	S
x3Me1PenteneAnd4Me1Pentene	Sum of 3-Methyl-1-pentene and 4-Methyl-1-pentene	C <sub>6</sub> H <sub>12</sub>	N/A	M
x2Me2Pentene	2-Methyl-2-pentene	C <sub>6</sub> H <sub>12</sub>	625-27-4	S
Z3Me2Pentene	(Z)-3-Methyl-2-pentene	C <sub>6</sub> H <sub>12</sub>	922-62-3	S
E3Me2Pentene	(E)-3-Methyl-2-pentene	C <sub>6</sub> H <sub>12</sub>	616-12-6	S
x3Me2Pentenes	Sum of (Z)-3-Methyl-2-pentene and (E)-3-Methyl-2-pentene	C <sub>6</sub> H <sub>12</sub>	922-61-2	M
Z4Me2Pentene	(Z)-4-Methyl-2-pentene	C <sub>6</sub> H <sub>12</sub>	691-38-3	S
E4Me2Pentene	(E)-4-Methyl-2-pentene	C <sub>6</sub> H <sub>12</sub>	674-76-0	S
x4Me2Pentenes	Sum of (Z)-4-Methyl-2-pentene and (E)-4-Methyl-2-pentene	C <sub>6</sub> H <sub>12</sub>	4461-48-7	M
CycHexane	Cyclohexane	C <sub>6</sub> H <sub>12</sub>	110-82-7	S
MeCycPentane	Methylcyclopentane	C <sub>6</sub> H <sub>12</sub>	96-37-7	S
nHeptane	n-Heptane	C <sub>7</sub> H <sub>16</sub>	142-82-5	S
x2MeHexane	2-Methylhexane	C <sub>7</sub> H <sub>16</sub>	591-76-4	S

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
x3MeHexane	3-Methylhexane	C <sub>7</sub> H <sub>16</sub>	589-34-4	S
x22DimePentane	2,2-Dimethylpentane	C <sub>7</sub> H <sub>16</sub>	590-35-2	S
x23DimePentane	2,3-Dimethylpentane	C <sub>7</sub> H <sub>16</sub>	565-59-3	S
x24DimePentane	2,4-Dimethylpentane	C <sub>7</sub> H <sub>16</sub>	0108-08-07	S
x33DimePentane	3,3-Dimethylpentane	C <sub>7</sub> H <sub>16</sub>	562-49-2	S
x1Heptene	1-Heptene	C <sub>7</sub> H <sub>14</sub>	592-76-7	S
MeCycHexane	Methylcyclohexane	C <sub>7</sub> H <sub>14</sub>	108-87-2	S
nOctane	n-Octane	C <sub>8</sub> H <sub>18</sub>	111-65-9	S
x224TrimePentane	2,2,4-Trimethylpentane	C <sub>8</sub> H <sub>18</sub>	540-84-1	S
x234TrimePentane	2,3,4-Trimethylpentane	C <sub>8</sub> H <sub>18</sub>	565-75-3	S
x2MeHeptane	2-Methylheptane	C <sub>8</sub> H <sub>18</sub>	592-27-8	S
x3MeHeptane	3-Methylheptane	C <sub>8</sub> H <sub>18</sub>	589-81-1	S
x1Octene	1-Octene	C <sub>8</sub> H <sub>16</sub>	111-66-0	S
nNonane	n-Nonane	C <sub>9</sub> H <sub>20</sub>	111-84-2	S
x1Nonene	1-Nonene	C <sub>9</sub> H <sub>18</sub>	124-11-8	S
aPinene	alpha-Pinene	C <sub>10</sub> H <sub>16</sub>	80-56-8	S
bPinene	beta-Pinene	C <sub>10</sub> H <sub>16</sub>	127-91-3	S
Camphene	Camphene	C <sub>10</sub> H <sub>16</sub>	79-92-5	S
Tricyclene	Tricyclene	C <sub>10</sub> H <sub>16</sub>	508-32-7	S
aTerpinene	alpha-Terpinene	C <sub>10</sub> H <sub>16</sub>	99-86-5	S
gTerpinene	gamma-Terpinene	C <sub>10</sub> H <sub>16</sub>	99-85-4	S
Myrcene	Myrcene	C <sub>10</sub> H <sub>16</sub>	123-35-3	S
Limonene	Limonene	C <sub>10</sub> H <sub>16</sub>	138-86-3	S
LimoneneD3Carene	Sum of Limonene and Δ <sup>3</sup> -Carene	C <sub>10</sub> H <sub>16</sub>	N/A	M
bPineneMyrcene	Sum of beta-Pinene and Myrcene	C <sub>10</sub> H <sub>16</sub>	N/A	M
Sabinene	Sabinene	C <sub>10</sub> H <sub>16</sub>	3387-41-5	S
dLimonene	D-Limonene	C <sub>10</sub> H <sub>16</sub>	5989-27-5	S
Terpinolene	Terpinolene	C <sub>10</sub> H <sub>16</sub>	586-62-9	S



<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
Monoterpenes	Sum of Monoterpenes	C <sub>10</sub> H <sub>16</sub>	N/A	M
nDecane	n-Decane	C <sub>10</sub> H <sub>22</sub>	124-18-5	S
x1Decene	1-Decene	C <sub>10</sub> H <sub>20</sub>	872-05-9	S
nUndecane	n-Undecane	C <sub>11</sub> H <sub>24</sub>	1120-21-4	S
nDodecane	nDodecane	C <sub>12</sub> H <sub>26</sub>	112-40-3	S
Dodecane	Sum of all dodecane isomers	C <sub>12</sub> H <sub>26</sub>	N/A	M
aCedrene	alpha-cedrene	C <sub>15</sub> H <sub>24</sub>	469-61-4	S
aHumulene	alpha-Humulene	C <sub>15</sub> H <sub>24</sub>	6753-98-6	S
<b>Hydrocarbons: Aromatics and Oxygenated Aromatics</b>				
Benzene	Benzene	C <sub>6</sub> H <sub>6</sub>	71-43-2	S
Toluene	Toluene	C <sub>7</sub> H <sub>8</sub>	108-88-3	S
oXylene	o-Xylene	C <sub>8</sub> H <sub>10</sub>	95-47-6	S
mXylene	m-Xylene	C <sub>8</sub> H <sub>10</sub>	108-38-3	S
pXylene	p-Xylene	C <sub>8</sub> H <sub>10</sub>	106-42-3	S
EthBenzene	Ethylbenzene	C <sub>8</sub> H <sub>10</sub>	100-41-4	S
mpXylene	Sum of m-Xylene and p-Xylene	C <sub>8</sub> H <sub>10</sub>	N/A	M
EthBenzmpXylene	Sum of Ethylbenzene and mp-Xylene	C <sub>8</sub> H <sub>10</sub>	N/A	M
C8Aromatics	Sum of C8-Aromatics	C <sub>8</sub> H <sub>10</sub>	N/A	M
Styrene	Styrene	C <sub>8</sub> H <sub>8</sub>	100-42-5	S
Ethynylbenzene	Ethynylbenzene	C <sub>8</sub> H <sub>6</sub>	536-74-3	S
C9Aromatics	Sum of C9-Aromatics	C <sub>9</sub> H <sub>12</sub>	N/A	M
nPropBenzene	n-Propylbenzene	C <sub>9</sub> H <sub>12</sub>	103-65-1	S
iPropBenzene	Isopropylbenzene	C <sub>9</sub> H <sub>12</sub>	98-82-8	S
x123TrimeBenzene	1,2,3-Trimethylbenzene	C <sub>9</sub> H <sub>12</sub>	526-73-8	S
x124TrimeBenzene	1,2,4-Trimethylbenzene	C <sub>9</sub> H <sub>12</sub>	95-63-6	S
x135TrimeBenzene	1,3,5-Trimethylbenzene	C <sub>9</sub> H <sub>12</sub>	108-67-8	S

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
x2EthToluene	2-Ethyltoluene	C <sub>9</sub> H <sub>12</sub>	611-14-3	S
x3EthToluene	3-Ethyltoluene	C <sub>9</sub> H <sub>12</sub>	620-14-4	S
x4EthToluene	4-Ethyltoluene	C <sub>9</sub> H <sub>12</sub>	622-96-8	S
pCymene	para-Cymene	C <sub>10</sub> H <sub>14</sub>	99-87-6	S
C10Aromatics	Sum of C10-Aromatics	C <sub>10</sub> H <sub>14</sub>	N/A	M
tButBenzene	tert-Butylbenzene	C <sub>10</sub> H <sub>14</sub>	98-06-6	S
nButBenzene	n-Butylbenzene	C <sub>10</sub> H <sub>14</sub>	104-51-8	S
mDiethBenzene	1,3-Eiethylbenzene	C <sub>10</sub> H <sub>14</sub>	141-93-5	S
pDiethBenzene	1,4,- Eiethylbenzene	C <sub>10</sub> H <sub>14</sub>	0105-05-05	S
oDiethBenzene	1,2,- Eiethylbenzene	C <sub>10</sub> H <sub>14</sub>	0135-01-03	S
C11Aromatics	Sum of C11-Aromatics	C <sub>11</sub> H <sub>16</sub>	N/A	M
Naphthalene	Naphthalene	C <sub>10</sub> H <sub>8</sub>	91-20-3	S
Benzaldehyde	Benzaldehyde	C <sub>7</sub> H <sub>6</sub> O	100-52-7	S
DHT	Sum of Dihydroxytoluene Isomers	C <sub>7</sub> H <sub>8</sub> O <sub>2</sub>	N/A	M
Phenol	Phenol	C <sub>6</sub> H <sub>5</sub> OH	108-95-2	S
Cresols	Sum of Cresol Isomers (Hydroxytoluenes)	C <sub>7</sub> H <sub>8</sub> O	N/A	M
Creosol	Creosol	C <sub>8</sub> H <sub>10</sub> O <sub>2</sub>	93-51-6	S
<b>Oxygenated Inorganic and Volatile Organic Carbon Species</b>				
CO	Carbon monoxide	CO	630-08-0	S
CO <sub>2</sub>	Carbon dioxide	CO <sub>2</sub>	124-38-9	S
x13CO <sub>2</sub>	13CO <sub>2</sub> -Carbon dioxide	<sup>13</sup> CO <sub>2</sub>	1111-72-4	S
x14CO <sub>2</sub>	14CO <sub>2</sub> -Carbon dioxide	<sup>14</sup> CO <sub>2</sub>	51-90-1	S
x18OCO	18OCO-Carbon dioxide	<sup>18</sup> OCO	N/A	S
CHOCHO	Glyoxal	C <sub>2</sub> H <sub>2</sub> O <sub>2</sub>	107-22-2	S
CH <sub>3</sub> COCHO	Methyl glyoxal	C <sub>3</sub> H <sub>4</sub> O <sub>2</sub>	78-98-8	S
CH <sub>3</sub> OH	Methanol	CH <sub>4</sub> O	67-56-1	S

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
CH2O	Formaldehyde	CH2O	50-00-0	S
CH3OOH	Methyl hydroperoxide	CH4O2	3031-73-0	S
HMHP	Hydroxymethyl hydroperoxide	CH4O3	15932-89-5	S
HCOOH	Formic acid	CH2O2	64-18-6	S
C2H5OH	Ethanol	C2H6O	64-17-5	S
CH3CHO	Acetaldehyde	C2H4O	75-07-0	S
Glycolaldehyde	Glycolaldehyde	C2H4O2	141-46-8	S
CH3COOH	Acetic acid	C2H4O2	64-19-7	S
CH3COOH and Glycolaldehyde	Sum of Acetic Acid and Glycolaldehyde	C2H4O2	N/A	M
MeFormate	Methyl Formate	C2H4O2	107-31-3	S
HAA	Hydroxyacetic acid; Glycolic acid	C2H4O3	79-14-1	S
PAA	Peracetic Acid	C2H4O3	79-21-0	S
iPropanol	Isopropanol	C3H8O	67-63-0	S
Propanal	Propanal	C3H6O	123-38-6	S
Acetone	Acetone	C3H6O	67-64-1	S
AcetonePropanal	Sum of Acetone and Propanal	C3H6O	N/A	M
Acrolein	Acrolein	C3H4O	0107-02-08	S
C3H6O2	Sum of C3H6O2 Isomers, including Hydroxyacetone	C3H6O2	N/A	M
EthFormate	Ethyl Formate	C3H6O2	109-94-4	S
MeAcetate	Methyl acetate	C3H6O2	79-20-9	S
C2H5COOH	Propanoic acid	C3H6O2	79-09-4	S
C3H6O3	Sum of C3H6O3 Isomers, including Hydroperoxy Acetone	C3H6O3	N/A	M
Butanal	Butanal	C4H8O	123-72-8	S
iButanal	Isobutanal	C4H8O	78-84-2	S
MEK	Methyl Ethyl Ketone	C4H8O	78-93-3	S
ButanalMEK	Sum of Butanal and MEK	C4H8O	N/A	M

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
C4Carbonyls	Sum of C4-Carbonyls	C <sub>4</sub> H <sub>8</sub> O	N/A	M
EthAcetate	Ethyl acetate	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	141-78-6	S
x14Dioxane	1,4-Dioxane	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	123-91-1	S
C4H8O3	Sum of C <sub>4</sub> H <sub>8</sub> O <sub>3</sub> Isomers, including C <sub>4</sub> Dihydroxy Carbonyls	C <sub>4</sub> H <sub>8</sub> O <sub>3</sub>	N/A	M
MAC	Methacrolein	C <sub>4</sub> H <sub>6</sub> O	78-85-3	S
MVK	Methyl Vinyl Ketone	C <sub>4</sub> H <sub>6</sub> O	78-94-4	S
MVKMAC	Sum of MVK and Methacrolein	C <sub>4</sub> H <sub>6</sub> O	N/A	M
E2Butenal	(E)-2-Butenal, trans-Crotonaldehyde	C <sub>4</sub> H <sub>6</sub> O	123-73-9	S
Z2Butenal	(Z)-2-Butenal, cis-Crotonaldehyde	C <sub>4</sub> H <sub>6</sub> O	15798-64-8	S
x2Butenals	Sum of (Z)- and (E)-2-Butenal isomers, Crotonaldehyde	C <sub>4</sub> H <sub>6</sub> O	4170-30-3	M
x23Butanedione	2,3-Butanedione	C <sub>4</sub> H <sub>6</sub> O <sub>2</sub>	431-03-8	S
C4H6O3	Sum of C <sub>4</sub> H <sub>6</sub> O <sub>3</sub> Isomers, including C <sub>4</sub> Hydroxy Dicarboxyls	C <sub>4</sub> H <sub>6</sub> O <sub>3</sub>	N/A	M
Furan	Furan	C <sub>4</sub> H <sub>4</sub> O	110-00-9	S
x2Furanone	2-Furanone, including 2(5H)Furanone and 2(3H)Furanone	C <sub>4</sub> H <sub>4</sub> O <sub>2</sub>	N/A	M
x23HFuranone	2(3H)-Furanone	C <sub>4</sub> H <sub>4</sub> O <sub>2</sub>	20825-71-2	S
x25HFuranone	2(5H)-Furanone	C <sub>4</sub> H <sub>4</sub> O <sub>2</sub>	497-23-4	S
SuccinicAnhyd	Succinic anhydride	C <sub>4</sub> H <sub>4</sub> O <sub>3</sub>	108-30-5	S
C4H4O3	Sum of C <sub>4</sub> H <sub>4</sub> O <sub>3</sub> Isomers	C <sub>4</sub> H <sub>4</sub> O <sub>3</sub>	N/A	M
MaleicAnhyd	Maleic anhydride	C <sub>4</sub> H <sub>2</sub> O <sub>3</sub>	108-31-6	S
MTBE	Methyl Tert-Butyl Ether	C <sub>5</sub> H <sub>12</sub> O	1634-04-04	S
MBO	2-Methyl-3-buten-2-ol	C <sub>5</sub> H <sub>10</sub> O	115-18-4	S
Pentanal	Pentanal	C <sub>5</sub> H <sub>10</sub> O	110-62-3	S
x2Pentanone	2-Pentanone	C <sub>5</sub> H <sub>10</sub> O	107-87-9	S

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
x3Pentanone	3-Pentanone	C <sub>5</sub> H <sub>10</sub> O	96-22-0	S
C5Carbonyls	Sum of C5-Carbonyls	C <sub>5</sub> H <sub>10</sub> O	N/A	M
ISOPOOHIEPOX	Sum of ISOPOOH and IEPOX	C <sub>5</sub> H <sub>10</sub> O <sub>3</sub>	N/A	M
IEPOX	Sum of Isoprene Epoxy Diol Isomers	C <sub>5</sub> H <sub>10</sub> O <sub>3</sub>	N/A	M
ISOPOOH	Sum of Isoprene Hydroxy Hydroperoxide Isomers	C <sub>5</sub> H <sub>10</sub> O <sub>3</sub>	N/A	M
C5H8O3	Sum of C5O3H8 Compounds, including HPALDs Isomers	C <sub>5</sub> H <sub>8</sub> O <sub>3</sub>	N/A	M
x2MeFuran	2-Methylfuran	C <sub>5</sub> H <sub>6</sub> O	534-22-5	S
x3MeFuran	3-Methylfuran	C <sub>5</sub> H <sub>6</sub> O	930-27-8	S
Furfural	Furfural	C <sub>5</sub> H <sub>4</sub> O <sub>2</sub>	98-01-1	S
x3Furaldehyde	3-Furaldehyde	C <sub>5</sub> H <sub>4</sub> O <sub>2</sub>	498-60-2	S
HPALDs	Sum of HPALDs	C <sub>5</sub> H <sub>8</sub> O <sub>3</sub>	N/A	M
Hexanal	Hexanal	C <sub>6</sub> H <sub>12</sub> O	66-25-1	S
x2Hexanone	2-Hexanone	C <sub>6</sub> H <sub>12</sub> O	591-78-6	S
x3Hexanone	3-Hexanone	C <sub>6</sub> H <sub>12</sub> O	589-38-8	S
C6Carbonyls	Sum of C6-Carbonyls	C <sub>6</sub> H <sub>12</sub> O	N/A	M
CycHexanone	Cyclohexanone	C <sub>6</sub> H <sub>10</sub> O	108-94-1	S
C6H10O5	Sum of Levoglucosan and other C6H10O5 species	C <sub>6</sub> H <sub>10</sub> O <sub>5</sub>	N/A	M
DimeFurans	Sum of Dimethylfurans	C <sub>6</sub> H <sub>8</sub> O	N/A	M
x25DimeFuran	2,5-dimethylfuran	C <sub>6</sub> H <sub>8</sub> O	625-86-5	S
x24DimeFuran	2,4-dimethylfuran	C <sub>6</sub> H <sub>8</sub> O	3710-43-8	S
Phenol	Phenol	C <sub>6</sub> H <sub>6</sub> O	108-95-2	S
C6H6O	Sum of Phenol and other C6H6O species	C <sub>6</sub> H <sub>6</sub> O	N/A	M
x5MeFurfural	5-methylfurfural	C <sub>6</sub> H <sub>6</sub> O <sub>2</sub>	620-02-0	S
Catechol	Catechol	C <sub>6</sub> H <sub>6</sub> O <sub>2</sub>	120-80-9	S
C6H6O2	Sum of Catechol and other C6H6O2 species	C <sub>6</sub> H <sub>6</sub> O <sub>2</sub>	N/A	M

<b>CoreName</b>	<b>Definition</b>	<b>Chemical Formula</b>	<b>CAS Number</b>	<b>Specificity</b>
C6H4O3	Hydroxybenzoquinone – including any compounds that can be viewed as derivatives of a benzoquinone	C6H4O3	N/A	M
Anisole	Anisole	C7H8O	100-66-3	S
C7H8O	Sum of C7H8O Isomers	C7H8O	N/A	M
Guaiacol	Guaiacol	C7H8O2	90-05-1	S
BenzFuran	Benzofuran	C8H6O	271-89-6	S
Syringol	Syringol	C8H10O3	91-10-1	S
C9H14O4	Sum of Pinic Acid and other C9H14O4 species	C9H14O4	N/A	M
C10H16O3	Sum of Pinonic Acid and other C10H16O3 species	C10H16O3	N/A	M
Linalool	Linalool	C10H18O	78-70-6	S
Terpineol	Terpineol	C10H18O	8006-39-1	S
aTerpineol	alpha-Terpineol	C10H18O	98-55-5	S
Geraniol	Geraniol	C10H18O	N/A	M
tGeraniol	trans-Geraniol	C10H18O	106-24-1	S
cGeraniol	cis-Geraniol	C10H18O	106-25-2	S
SabineneHydrate	Sabinene hydrate	C10H18O	546-79-2	S
Borneol	Borneol	C10H18O	N/A	M
Pulegone	Pulegone	C10H16O	89-82-7	S
LFenchone	L-Fenchone	C10H16O	7787-20-4	S
Fenchol	Fenchol	C10H16O	2217-02-09	S
Camphor	Camphor	C10H16O	N/A	M
Guaiol	Guaiol	C15H26O	489-86-1	S
tNeroidol	trans-Neroidol	C15H26O	40716-66-3	S

## 2.2 Aerosol Particle Standard Names

The MeasurementCategory for aerosol particles is either “AerMP”, “AerComp”, or “AerOpt” for aerosol particle microphysical properties, aerosol particle composition, and aerosol particle 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 10.

For aerosol particle 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 particle measurements can be made or calculated at different RH levels. Table 5 defines the three possible modes of aerosol particle measurements related to relative humidity levels (MeasurementRH): RHd, RHa, and RHsp. If “RHsp” is used, the relative humidity at which the measurement is reported must be documented in the variable description.

Table 5: List of Possible Aerosol Particle Measurement RH values

MeasurementRH	Description
RHd	Variable reported at a reduced relative humidity, typically less than 40%
RHa	Variable reported at ambient relative humidity
RHsp	Variable reported at a specified relative humidity
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 6 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 6: List of Aerosol Particle 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; DeCarlo et al., 2004).
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 (DeCarlo et al., 2004).
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 $\gg 1$ ) ; DeCarlo et al., 2004).
LII	LII (Laser-induced incandescence) 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

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 7). When “Bulk” is used, SizingTechnique must be “None”.

Table 7: Summary of Aerosol Particle Size Ranges

<b>SizeRange</b>	<b>Description</b>
Nucl	Nucleation-mode aerosol particles: 0.001-0.1 um diameter
Accu	Accumulation-mode aerosol particles: 0.1-1 um diameter
Coarse	Coarse-mode aerosol particles: greater than 1 um diameter
Bulk	Measurement not size resolved
PM1	Submicron aerosol particles: less than 1 um diameter



<b>SizeRange</b>	<b>Description</b>
PMx	Particles with diameter under X um diameter
XtoY	Size Range from X to Y, e.g., NucltoAccu

Aerosol particle optical properties are functions of wavelengths (WL) of light. Therefore, a measurement of aerosol particle optical properties is made at one or more specific wavelength(s). Table 8 lists the values for “WL” attributes, specifying the wavelength ranges within which instruments commonly operate.

Table 8: List of Wavelength Ranges for Aerosol Particle Optical Property Measurements

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

Lastly, aerosol particle standard names have a DescriptiveAttribute to indicate the reporting method used. Aerosol particle chemical compositions can be reported as mass concentrations at either STP or ambient temperature and pressure, mass fractions, or number fractions. Similarly, aerosol particle 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 is “None”. See Table 9 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 must be noted in the header or metadata of the data file, as “standard temperature” varies across the research community. Similarly, if the reporting attribute is “EnvSp”, the specific environment temperature and pressure must be referenced in the header or variable description.

Table 9: Reporting Attribute Values for Aerosol Particle Measurements

<b>Reporting</b>	<b>Description</b>
MassSTP	Mass concentration reported at standard temperature and pressure
MassAMB	Mass concentration reported at ambient temperature and pressure

<b>Reporting</b>	<b>Description</b>
MassFrac	Mass Fraction - Ratio of a constituent mass to the total aerosol particle mass concentration
NumFrac	Number Fraction - Ratio of a constituent number to the total aerosol particle number concentration
NumConcSTP	Number concentration of particle constituent at standard temperature and pressure
NumConcAMB	Number concentration of particle constituent at ambient temperature and pressure
STP	Aerosol particle properties reported at standard temperature and pressure
AMB	Aerosol particle properties reported at ambient temperature and pressure
None	For dimensionless variables
EnvSp	Aerosol particle properties reported in a specific environment (e.g., mobile vehicle) with specified temperature and pressure

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

***Aerosol Particle Microphysical Properties:***

AerMP\_CoreName\_AcquisitionMethod\_MeasurementRH\_SizingTechnique\_SizeRange\_Reporting

AcquisitionMethod = InSitu, VertCol, SlantCol, Profile

MeasurementRH = RHd, RHa, RHsp, None

SizingTechnique = Mobility, Optical, Aerodynamic, VacuumAerodynamic, LII, Imaging, Geometric, Kelvin, None

SizeRange = Nucl, Accu, Coarse, Bulk, PM1, PMx, XtoY

Reporting = STP, AMB, None, EnvSp

*Example of an in-situ measurement of aerosol particle 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 Particle Chemical Composition:***

AerComp\_CoreName\_AcquisitionMethod\_SizingTechnique\_SizeRange\_Reporting

AcquisitionMethod = InSitu, VertCol, SlantCol, Profile

SizingTechnique = Mobility, Optical, Aerodynamic, VacuumAerodynamic, LII, Imaging, Geometric, Kelvin, 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 particles derived using a vacuum aerodynamic technique for accumulation-mode aerosol particles 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 Particle Optical Properties:***

AerOpt\_CoreName\_AcquisitionMethod\_WL\_MeasurementRH\_SizeRange\_Reporting  
 AcquisitionMethod = InSitu, VertCol, SlantCol, Profile  
 WL = UV, Blue, Green, Red, IR, XtoY  
 MeasurementRH = RHd, RHa, RHsp, None  
 SizeRange = Nucl, Accu, Coarse, Bulk, PM1, PMx, XtoY  
 Reporting = STP, AMB, None, EnvSp

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

AerOpt\_Absorption\_InSitu\_red\_RHd\_Bulk\_AMB

Table 10: List of Aerosol Particle Measurement CoreNames

<b>Measurement Category</b>	<b>CoreName</b>	<b>Definition</b>
AerMP	NumConc	Number Concentration of Aerosol Particles
AerMP	NonVolatileNumConc	Non-Volatile Number Concentration of Aerosol Particles
AerMP	SurfAreaConc	Surface Area Concentration of Aerosol Particles
AerMP	NonVolatileSurfAreaConc	Non-Volatile Surface Area Concentration of Aerosol Particles
AerMP	VolConc	Volume Concentration of Aerosol Particles
AerMP	NonVolatileVolConc	Non-Volatile Volume Concentration of Aerosol Particles
AerMP	CCN	Cloud Condensation Nuclei Concentration
AerMP	CCNtoCNRatio	Cloud Condensation Nuclei to Condensation Nuclei Ratio
AerMP	INP	Ice Nucleating Particles

<b>Measurement Category</b>	<b>CoreName</b>	<b>Definition</b>
AerMP	gRH	Aerosol Particle Size Growth Factor
AerMP	MassSizeDist	Mass Concentration Size Distribution of Aerosol Particles
AerMP	MassConc	Mass Concentration of Aerosol Particles
AerMP	NonVolatileMassSizeDist	Non-Volatile Mass Concentration Size Distribution of Aerosol Particles
AerMP	NumSizeDist	Number Concentration Size Distribution of Aerosol Particles
AerMP	NonVolatileNumSizeDist	Non-Volatile Number Size Distribution of Aerosol Particles
AerMP	SurfAreaSizeDist	Surface Area Concentration Size Distribution of Aerosol Particles
AerMP	NonVolatileSurfAreaSizeDist	Non-Volatile Surface Area Concentration Size Distribution
AerMP	VolSizeDist	Volume Concentration Size Distribution of Aerosol Particles
AerMP	NonVolatileVolSizeDist	Non-Volatile Volume Concentration Size Distribution of Aerosol Particles
AerMP	EffSize	Aerosol Particle Effective Size – Surface Area Weighted Average Size
AerMP	EffVar	Aerosol Particle Effective Variance – Width of Aerosol Size Distribution
AerMP	MeanSize	Aerosol Particle Mean Size (Radius or Diameter)
AerMP	BCFracIM	Black Carbon Fraction of Internally Mixed
AerMP	BCCoatThick	Black Carbon Coating Thickness
AerComp	Acidity	Aerosol Particle Acidity
AerComp	BC	Particulate Black Carbon
AerComp	BCMassSizeDist	Particulate Black Carbon Mass Size Distribution
AerComp	BCNumSizeDist	Particulate Black Carbon Number Size Distribution
AerComp	Bromide	Particulate Bromide Ion
AerComp	Calcium	Particulate Calcium Ion

<b>Measurement Category</b>	<b>CoreName</b>	<b>Definition</b>
AerComp	Chloride	Particulate Chloride Ion
AerComp	Potassium	Particulate Potassium Ion
AerComp	Magnesium	Particulate Magnesium Ion
AerComp	Iodine	Particulate Iodine Ion
AerComp	Sodium	Particulate Sodium Ion
AerComp	Nitrite	Particulate Nitrite Ion
AerComp	Nitrate	Particulate Nitrate Ion
AerComp	OrganicAerosol	Particulate organic matter, including carbon and all other elements (e.g. H, O, N) in organic molecules
AerComp	OrganicCarbon	Carbon contained in particulate organic matter, not including the mass of other elements in the organic molecules (e.g. H, O, N)
AerComp	HtoORatio	Hydrogen to Oxygen Ratio in Organic particulate matter
AerComp	Oxalate	Particulate Oxalate Ion
AerComp	Sulfate	Particulate Sulfate Ion
AerComp	TotalMass	Total Particulate Mass
AerComp	WSOC	Particulate Water Soluble Organic Carbon, a subset of OrganicAerosol and OrganicCarbon, including only the mass of carbon (and not H, O, N) in the water-soluble molecules
AerComp	Ammonium	Particulate Ammonium Ion
AerComp	Acid	Particulate Aerosol Acid
AerComp	NegativeIon	Total Particulate Negative Ions
AerComp	PositiveIon	Total Particulate Positive Ions
AerComp	BBParticles	Biomass Burning Particles
AerComp	Mineral	Mineral Particles
AerComp	Seasalt	Sea Salt Particles
AerComp	Soot	Soot Particles

<b>Measurement Category</b>	<b>CoreName</b>	<b>Definition</b>
AerComp	Beryllium7	Particulate Beryllium7
AerComp	Lead210	Particulate Lead210
AerComp	MSA	Particulate Methanesulfonic Acid Mass
AerComp	ClO4	Particulate Perchlorate Mass
AerComp	AmmBalance	Molar ratio of Ammonium to other inorganic ions in Particulate Matter
AerComp	Density	Particulate Matter Density
AerComp	OADensity	Particulate Organic Matter Density
AerComp	OAtOC	Ratio of Organic Particulate Matter to Organic Carbon (OC)
AerComp	Osc	Particulate Carbon Oxidation State
AerComp	OrgNitrFraction	Particulate Fraction of nitrate coming from organic nitrates
AerComp	BioAerosol	Particulate Biological Aerosol
AerOpt	Absorption	Aerosol Particle 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 Particle Scattering Coefficient
AerOpt	BackScattering	Aerosol Particle Backscattering Coefficient
AerOpt	Extinction	Aerosol Particle Extinction Coefficient
AerOpt	KExtinction	Aerosol Particle Extinction Cross Section
AerOpt	LidarRatio	Ratio of Aerosol Extinction Coefficient to Backscattering Coefficient of Aerosol Particles
AerOpt	AerosolType	Classification of Aerosol Particles Determined from Optical Properties
AerOpt	AngstromExponentAbs	Aerosol Particle Angstrom Exponent for Absorption Coefficients
AerOpt	AngstromExponentScat	Aerosol Particle Angstrom Exponent for Scattering Coefficients
AerOpt	AngstromExponentBackScat	Aerosol Particle Angstrom Exponent for

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

### 2.3 Cloud Standard Names

Similar to aerosol particle 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 15. 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 11 for a description of these techniques.

Table 11: Summary of Cloud Particle Sizing Techniques

<b>SizingTechnique</b>	<b>Description</b>
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 particle sizes, which can be categorized as either droplets (“Drop”), precipitation (“Precip”), or “Bulk”. When “Bulk” is used, the accompanying SizingTechnique must be “None”. Table 12 specifies the SizeRange for each of these ranges.

Table 12: Specification of Cloud Particle Size Ranges

<b>SizeRange</b>	<b>Description</b>
Drop	Droplets: Particle size range: 2-50 um diameter
Precip	Precipitation: Particle size range: greater than 50 um diameter
Bulk	Measurement not size resolved
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 13 lists the WL DescriptiveAttributes specifying the wavelength ranges within which instruments commonly operate.



Table 13: List Wavelength Ranges for Cloud Optical Property Measurements

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

Table 14: Reporting Attribute Values for Cloud Measurements

<b>Reporting</b>	<b>Description</b>
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 cloud mass concentration
NumFrac	Number Fraction - Ratio of a constituent number to the total particle number concentration
NumConc	Number concentration of particle constituent
STP	Cloud properties reported at standard temperature and pressure
AMB	Cloud properties reported at ambient temperature and pressure
None	For dimensionless variables

***Cloud Variables for Microphysical Properties:***

CldMicro\_CoreName\_AcquisitionMethod\_SizingTechnique\_SizeRange\_Reporting

AcquisitionMethod = InSitu, VertCol, SlantCol, Profile

SizingTechnique = Imaging, Optical, None

SizeRange = Drop, Precip, Bulk, XtoY

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\_AcquisitionMethod\_SizingTechnique\_SizeRange\_Reporting  
 AcquisitionMethod = InSitu, VertCol, SlantCol, Profile  
 SizingTechnique = Imaging, Optical, None  
 SizeRange = Drop, Precip, Bulk, XtoY  
 Reporting = MassSTP, MassAMB, MassFrac, NumFrac, NumConc

*Example of an in-situ measurement of the mass concentration of sodium derived from a chemical technique where the particle measurement is not size resolved reported at ambient conditions:*  
 CldComp\_Sodium\_InSitu\_None\_Bulk\_MassAMB

***Cloud Variables for Optical Properties:***

CldOpt\_CoreName\_AcquisitionMethod\_WL  
 AcquisitionMethod = InSitu, VertCol, SlantCol, Profile  
 WL = UV, Blue, Green, Red, IR, or XtoY

*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\_AcquisitionMethod\_None  
 AcquisitionMethod = InSitu, VertCol, SlantCol, Profile

*Example of an in-situ measurement of cloud top height:* CldMacro\_CTH\_InSitu\_None

Table 15: List of CoreNames for Cloud Property Measurements

<b>Measurement Category</b>	<b>CoreName</b>	<b>Definition</b>
CldMicro	CrossSectionalAreaSizeDist	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
CldMicro	SurfAreaConc	Cloud Particle Surface Area Concentration
CldMicro	VolConc	Cloud Particle Volume Concentration
CldMicro	SurfAreaSizeDist	Cloud Particle Surface Area Concentration Size Distribution

<b>Measurement Category</b>	<b>CoreName</b>	<b>Definition</b>
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 Volume
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	INP	Ice Nucleating Particles
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
CldComp	Nitrate	Cloud Water Mass Concentration of Nitrate
CldComp	Oxalate	Cloud Water Mass Concentration of Oxalate

<b>Measurement Category</b>	<b>CoreName</b>	<b>Definition</b>
CldComp	Lithium	Cloud Water Mass Concentration of Lithium
CldComp	Beryllium	Cloud Water Mass Concentration of Beryllium
CldComp	Boron	Cloud Water Mass Concentration of Boron
CldComp	Aluminium	Cloud Water Mass Concentration of Aluminium
CldComp	Silicon	Cloud Water Mass Concentration of Silicon
CldComp	Phosphorus	Cloud Water Mass Concentration of Phosphorus
CldComp	Sulfur	Cloud Water Mass Concentration of Sulfur
CldComp	Titanium	Cloud Water Mass Concentration of Titanium
CldComp	Vanadium	Cloud Water Mass Concentration of Vanadium
CldComp	Chromium	Cloud Water Mass Concentration of Chromium
CldComp	Manganese	Cloud Water Mass Concentration of Manganese
CldComp	Iron	Cloud Water Mass Concentration of Iron
CldComp	Cobalt	Cloud Water Mass Concentration of Cobalt
CldComp	Nickel	Cloud Water Mass Concentration of Nickel
CldComp	Copper	Cloud Water Mass Concentration of Copper
CldComp	Zinc	Cloud Water Mass Concentration of Zinc
CldComp	Arsenic	Cloud Water Mass Concentration of Arsenic
CldComp	Selenium	Cloud Water Mass Concentration of Selenium
CldComp	Rubidium	Cloud Water Mass Concentration of Rubidium
CldComp	Strontium	Cloud Water Mass Concentration of Strontium
CldComp	Yttrium	Cloud Water Mass Concentration of Yttrium
CldComp	Zirconium	Cloud Water Mass Concentration of Zirconium
CldComp	Niobium	Cloud Water Mass Concentration of Niobium
CldComp	Molybdenum	Cloud Water Mass Concentration of Molybdenum
CldComp	Ruthenium	Cloud Water Mass Concentration of Ruthenium
CldComp	Palladium	Cloud Water Mass Concentration of Palladium
CldComp	Silver	Cloud Water Mass Concentration of Silver
CldComp	Cadmium	Cloud Water Mass Concentration of Cadmium

<b>Measurement Category</b>	<b>CoreName</b>	<b>Definition</b>
CldComp	Tin	Cloud Water Mass Concentration of Tin
CldComp	Tellurium	Cloud Water Mass Concentration of Tellurium
CldComp	Caesium	Cloud Water Mass Concentration of Caesium
CldComp	Barium	Cloud Water Mass Concentration of Barium
CldComp	Hafnium	Cloud Water Mass Concentration of Hafnium
CldComp	Tantalum	Cloud Water Mass Concentration of Tantalum
CldComp	Osmium	Cloud Water Mass Concentration of Osmium
CldComp	Platinum	Cloud Water Mass Concentration of Platinum
CldComp	Gold	Cloud Water Mass Concentration of Gold
CldComp	Mercury	Cloud Water Mass Concentration of Mercury
CldComp	Thallium	Cloud Water Mass Concentration of Thallium
CldComp	Lead	Cloud Water Mass Concentration of Lead
CldComp	WSOC	Cloud Water Mass Concentration of Water Soluble Organic Carbon

#### 2.4 Meteorology Standard Names

The “MeasurementCategory” for meteorology parameters is Met. CoreNames for meteorology variables are listed in Table 16. There are no DescriptiveAttributes associated with meteorology variables (i.e., DescriptiveAttributes = None).

#### ***Meteorology Parameters:***

Met\_CoreName\_AcquisitionMethod\_None

AcquisitionMethod = InSitu, VertCol, SlantCol, Profile

*Example of an in-situ measurement of static temperature:* Met\_StaticTemperature\_InSitu\_None

Table 16: List of CoreNames for Meteorological Measurements

<b>CoreName</b>	<b>Definition</b>
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)

<b>CoreName</b>	<b>Definition</b>
PartialPressureH2O	Partial pressure of water vapor in air
H2OMRV	Volumetric water vapor mixing ratio
H2OMR	Mass mixing ratio of water vapor to dry air mass
H2OdD	Deviations in the D/H Stable Hydrogen Isotope Ratio relative to H <sub>2</sub> O vapor
H2Od18O	Deviations in the <sup>18</sup> O/ <sup>16</sup> O Stable Oxygen Isotope Ratio relative to H <sub>2</sub> O vapor
H2OTotalDMR	Mass mixing ratio of total water (vapor + liquid + ice) over dry air
VWP	Vapor Water Path – column integrated water vapor content
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 – Equilibrium saturation water vapor pressure with respect to water ice
SatVaporPressureH2OWater	Saturation Vapor Pressure over liquid Water – Equilibrium saturation water vapor pressure with respect to liquid water
SurfaceTemperature	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

<b>CoreName</b>	<b>Definition</b>
SolarZenithAngle	Solar Zenith Angle
Ustar	Friction Velocity
Wstar	Convective Velocity Scale
TKE	Turbulent Kinetic Energy
TEDR	Turbulent Dissipation Rate
REYN	Reynolds Number
LatentHeatFlux	Latent Heat Flux
SensibleHeatFlux	Sensible Heat Flux
Obukhov	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
MixedLayerHeight	Height of the planetary boundary layer defined by an aerosol particle gradient
Insolation	Amount of solar radiation reaching the Earth's surface
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

### 2.5 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 17. There is no need for further description (i.e., DescriptiveAttributes always has the value of "None"), and the AcquisitionMethod is always "InSitu".

**Platform Navigation:**

Platform\_CoreName\_AcquisitionMethod\_None

AcquisitionMethod = InSitu

*Example of an in-situ measurement for aircraft Yaw angle: Platform\_YawAngle\_InSitu\_None*

Table 17: List of CoreNames for Measurement Platform Navigation and Attitude

<b>CoreName</b>	<b>Description</b>
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**
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



CoreName	Description
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 must be defined in variable long name and/or in file header

## 2.6 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 18) consist of “j” plus the CoreName of the gas phase reactants previously given in Table 4. There are no aqueous phase photolysis rate coefficient measurements from current suborbital field studies. The AcquisitionMethod 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” has the value of “NoProductsSpecified”.

### **Photolysis Rates:**

MeasurementCategory\_CoreName\_AcquisitionMethod\_MeasurementDirection\_SpectralCoverage\_Products

MeasurementCategory = GasJvalue or AquJvalue

AcquisitionMethod = InSitu

MeasurementDirection = Downwelling, Upwelling, or Total

SpectralCoverage = Partial, Full

*Example of photolysis rate coefficient for reaction  $NO_2 + hv \rightarrow NO + O(3P)$  derived from total actinic flux measurement:*

GasJvalue\_jNO2\_InSitu\_Total\_Full\_NO2-O3P

*Example of photolysis rate coefficient for reaction  $CHBr_3 + hv \rightarrow$  products derived from downwelling actinic flux measurement:*

GasJvalue\_jCHBr3\_InSitu\_Downwelling\_Full\_NoProductsSpecified

*Example of photolysis rate coefficient for reaction  $HNO_4 + hv \rightarrow HO_2 + NO_2$  derived from total actinic flux measurement:*

GasJvalue\_jHNO4\_InSitu\_Total\_Partial\_HO2-NO2

Table 18: List of CoreNames for Gas Phase Photolytic Rate Coefficients

<b>CoreName</b>	<b>Definition</b>
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
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

<b>CoreName</b>	<b>Definition</b>
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
jHydroxyacetone	Rate Coefficient for Photolysis of Hydroxyacetone

## 2.7 Radiation Standard Names

The “Rad” MeasurementCategory is a group of standard names that describe radiation measurement variables. The AcquisitionMethod for this category is always “InSitu”, and possible CoreNames are given in Table 19. 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 19: 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
RadianceDownwellingZenith	Radiant flux emitted, reflected, transmitted or received by a surface, per unit solid angle per unit projected area, for the radiance measured via a narrow field of view pointed directly at zenith, usually under clouds.
RadianceDownwellingSky	Radiant flux emitted, reflected, transmitted or received by a surface, per unit solid angle per unit projected area, for the radiance measured via a narrow field of view pointed at defined points in the sky, sampling diffuse skylight.
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

### 3 Maintenance and Future

This document is intended to be a living document. To stay relevant to the measurements and user community, CoreNames and Descriptive Attributes will be updated and/or modified after each major field campaign. The process for creating new CoreNames will involve the collection of new measurements from the principle investigator, review through literature search and peer comments, and following a similar structure to current measurements. To date, the current list of atmospheric composition standard names has been successfully implemented in the FIREX-AQ, CAMP<sup>2</sup>EX, and ACTIVATE field campaigns. With the help of the field campaign PIs over one hundred new measurement core names have been added to this document since prior to these campaign data submissions. This document will be maintained by Morgan Silverman and the Earth Venture-SubOrbital Support Team (EV-SOS) at the NASA Langley Atmospheric Science Data Center.

## 4 References

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