PID Correction Factors

Introduction

Photo-ionization Detectors (PIDs) respond to a broad range of chemicals including many volatile organic compounds (VOCs) like alcohols and solvents, and some inorganic compounds, like ammonia and hydrogen sulfide. If the compound to be measured is also used to calibrate the PID, then the display will show directly the concentration of that compound. However, it is often difficult or costly to obtain a gas standard of the compound to be measured, and therefore a surrogate standard gas, typically isobutylene (IBE) is commonly used to calibrate the PID. This Tech/App Note lists the correction factors used to allow accurate measurement of hundreds of VOCs with different sensitivity using only isobutylene to calibrate. Isobutylene has the advantages that it is low cost, readily available, has low toxicity, and is not prone to adsorption losses on tubing connections.

PPM BENZ PPB

NEO Series PIDs

Correction Factor Definition

With a PID calibrated to isobutylene and used to measure another compound, the reading is multiplied by the correction factor to obtain the true concentration:

$$\text{True Concentration} = \text{Reading} \times CF$$

For example, if the unit is calibrated with IBE but used to measure acrolein with a CF of 3.9 and the reading is 10 ppm, then the true concentration of acrolein is 10 x 3.9 = 39 ppm. The mPower NEO series PID has about 700 correction factors in a built-in library. When the appropriate factor is called up, the unit displays the corrected reading directly as the true concentration of the compound. A compound with CF<1 is more sensitive than IBE while one with CF>1 is less sensitive than IBE.

Unknown Compounds or Compound Mixtures

For known compound mixtures (such as paint solvents), an overall CF for the mixture can be calculated as:

$$CF_{mix} = 1 / [X_1/CF_1 + X_2/CF_2 + \ldots X_n/CF_n]$$

Where X_n and CF_n are the mole fraction and correction factor for component n, respectively (In the case of a paint solvent the mole fractions can be obtained from the MSDS). However, if the mixture is variable over time, then it is not possible to calculate an accurate CF or concentration. Likewise, if the nature of the VOC is unknown, then the PID cannot apply a proper factor or calculate a true concentration. In such cases the response is deemed to be an “Isobutylene-equivalent” response.

Matrix Gas Effects

The CFs in this document apply to measurements in dry air, unless noted. In most cases, matrix gas effects can be ignored, but for unusual situations corrections may be needed.

- *Oxygen* at 100% reduces the VOC response by roughly 60% compared to pure nitrogen. Thus readings in pure nitrogen (N_2) are about 20% higher than in air (78% N_2/21% O_2).
- *Hydrogen/Helium/Argon* have little effect other than removing the oxygen quenching, and thus they cause about 20% increase in VOC response compared to air.
- *Methane/Propane* above about 1% by volume cause significant quenching of VOC readings. Therefore, PID measurements cannot be made in pure natural gas or liquid petroleum gas. In

some cases, it is possible to dilute the fuel gas 100-fold to avoid the quenching and still have a measurable response to the minor component of interest. Also in some cases, the ethylene oxide (ETO) electrochemical sensor can be used to measure VOCs in the presence of high levels of methane (see TA Note 9 – *ETO EC Sensor for Selected VOCs*).

- *Water Vapor*. Humidity near 100% at room temperature can reduce the PID response to VOCs by about 40%. Below 50% RH corrections are generally not needed. Contact mPower for more details on how to make measurements in high-humidity environments.
- *Carbon Dioxide* at 100% reduces the VOC response by about 20% compared to air.

Concentration Limits

The CFs in Table 1 were typically measured at 100 ppm or less and apply to concentration ranges from low ppb to a few thousand ppm. At higher concentrations, the factors are less accurate because curve-fitting is required to linearize the VOC response, and such curve fits are slightly different for each compound and instrument. For best accuracy, we recommend calibrating at concentrations in the general range of the expected VOC readings.

Compound Formula and CAS No.

In Table 1, the chemical formula together with the Chemical Abstracts Service Number (CAS No.) provide a means of uniquely identifying the compound.

Compound Molecular Weight and Boiling Point

Light, volatile compounds give a fast PID response, whereas compounds with high molecular weight (m.w.) over 100 tend to give slower response. If the m.w. is over 100 Table 1, we suggest looking up the compound boiling point, which is a better measure of volatility. Chemicals with low boiling points, below about 100°C, give a very fast response time of just a few seconds on the NEO series PIDs. Those with higher boiling points have increasingly slower response so that compounds boiling at 200°C may take up to a minute to obtain a steady reading. At even higher boiling points, accuracy begins to be impaired, as the compound vapors tend to be lost by deposition onto filters and inlet tubing and connections. For compounds like Therminol VP-1 with a b.p. of 257°C, the PID acts primarily as a leak detector without providing a precise concentration reading. A boiling point of 300°C is the upper limit for detectable compounds.

TWA

The Time-Weighted Average (TWA) is a dose limit for worker exposure. This is included in the table to give an estimate of the toxicity of the compound and the concentration range that typically needs to be measured when the PID is used for industrial hygiene purposes.

Disclaimer

The use of correction factors is always less accurate than calibrating directly with the compound to be measured. CF values are known to ±10% at best, more commonly to ±20%, and in some cases with even greater uncertainty. Only a few dozen of the values in this table were measured directly with mPower PIDs and the rest taken from the literature. A correlation analysis shows that these factors agree closely with those of other handheld PID manufacturers, with the exception that mPower CF values for 9.8 eV lamps that are above 5 in the table below are significantly lower than those for most other manufacturers. If high accuracy is needed for a particular application and the user cannot calibrate with the compound of interest, please contact mPower to evaluate the accuracy of the listed CF and, if necessary, re-measure the CF value.

Notes on CF and IE Columns

A CF value listed as NR means it is confirmed to have no response. A CF listed as 0 indicates that no measurements are available, but the compound may respond. The IE column (Ionization Energy) may be used to predict detectability: if the compound's IE is less than the lamp photon energy of 9.8 eV or 10.6 eV, then the compound should be detectable using the respective lamp.

Table 1. Correction Factors for Measuring Various Compounds by PID

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Acetaldehyde	Ethanal	C2H4O	75-07-0	44.1	21	C25	0	6	10.23
Acetamide		C2H5NO	60-35-5	59.1			0	2.1	9.69
Acetic acid	Ethanoic acid	C2H4O2	64-19-7	60.1	118	10	0	22	10.68
Acetic anhydride		C4H6O3	108-24-7	102.1		5	0	6.1	10.14
Acetoin	3-Hydroxybutanone	C4H8O2	513-86-0	88.1			2	1.1	~9.6
Acetone	2-Propanone	C3H6O	67-64-1	58.1	56	250	1.2	1.1	9.69
Acetone cyanohydrin	Hydroxyisobutyronitrile	C4H7NO	75-86-5	85.1		C5	0	0	11.1
Acetonitrile	Methyl cyanide	C2H3N	75-05-8	41.1		20	NR	NR	12.20
Acetophenone	Methyl phenyl ketone	C8H8O	98-86-2	120.1		10	0	0.7	9.29
Acetyl bromide		C2H3BrO	506-96-7	122.9			0	7.9	10.24
Acetylene		C2H2	74-86-2	26	-84		NR	NR	11.40
Acetylglycine, N-		C4H7NO3	543-24-8	117.1			0	1.9	9.40
Acrolein	Propenal	C3H4O	107-02-8	56.1	53	0.1	42	3.9	10.10
Acrylic acid	Propenoic acid	C3H4O2	79-10-7	72.1	141	2	0	12	10.60
Acrylonitrile	Propenenitrile	C3H3N	107-13-1	53.1		2	NR	NR	10.91
Allyl acetoacetate		C7H10O3	1118-84-9	142.2			0	1.6	~9.8
Allyl alcohol		C3H6O	107-18-6	58.1		2	4.5	2.4	9.63
Allylamine		C3H7N	107-11-9	57.1			0	0.9	8.80
Allyl bromide	Bromopropene	C3H5Br	106-95-6	121			0	3.1	9.96
Allyl chloride	Chloropropene	C3H5Cl	107-05-1	76.5		1	0	4.6	10.05
Allyl glycidyl ether	AGE	C6H10O2	106-92-3	114.1		1	0	0.9	~10
Aminomethylpropanol		C4H11NO	124-68-5	89.1			0	1.5	~8.7
Ammonia	R717	NH3	7664-41-7	17	-33	25	0	12.7	10.07
Amyl acetate	Mix of Pentyl acetate & 2-Methylbutyl acetate	C7H14O2	628-63-7	130.2		50	11	2.3	9.9
Amyl acetate, s-	2-Pentyl acetate	C7H14O2	626-38-0	130.2		50	0	4.9	9.9
Amyl alcohol	Pentanol	C5H12O	71-41-0	88.1		100	9.9	2.5	10.00
Amyl alcohol, tert-	t-Pentanol	C5H12O	75-85-4	88.1			2.9	1.6	9.80
Amylene	2-Methyl-2-butene	C5H10	513-35-9	70.1			0.9	0.9	
Anethole	p-Propenylanisole	C10H12O	104-46-1	148.2			0	0.5	~9
Aniline	Aminobenzene	C7H7N	62-53-3	93.1	184	2	0.5	0.48	7.70
Anisole	Methoxybenzene	C7H8O	100-66-3	108.1			0.89	0.58	8.21
Anisyl aldehyde		C8H8O2	123-11-5	136.1			0	0.5	~8
Arsine		AsH3	7784-42-1	77.9	-63	0.005	0	1.9	~9.6
Benzaldehyde		C7H6O	100-52-7	106.1		2	0.8	0.6	9.49
Benzene	Benzol	C6H6	71-43-2	78.1	80	0.5	0.48	0.5	9.24
Benzenethiol	Thiophenol	C7H7S	100-53-8	124.2			0.9	0.9	8.50
Benzoic acid		C7H6O2	65-85-0	122.1			0	0.8	9.30
Benzonitrile	Cyanobenzene	C7H5N	100-47-0	103.1			0.9	0.8	9.62
Benzoquinone, o-		C6H4O2	583-63-1	108.1			0	0.9	9.30
Benzoquinone, p-		C6H4O2	106-51-4	108.1		0.1	0	1.1	10.01
Benzoyl bromide		C7H5BrO	618-32-6	185			0	1.9	9.65
Benzyl acetate		C9H10O2	140-11-4	150.2		10	0	0.7	~8.5
Benzyl alcohol		C7H8O	100-51-6	108.1	205	10	1.4	1.1	8.26
Benzylamine		C7H9N	100-46-9	107.2			0	0.7	7.56
Benzyl chloride	a-Chlorotoluene	C7H7Cl	100-44-7	126.6		1	0.7	0.6	9.14
Benzyl formate		C8H8O2	104-57-4	136.1			0.9	0.73	9.32
Benzyl isobutyrate		C11H14O2	103-28-6	178.2			0	0.6	~9
Benzyl nitrile	Phenylacetonitrile	C8H7N	140-29-4	117.1			0	0.9	9.39
Benzyl propionate		C10H12O2	122-63-4	164.2			0	0.9	~9
Biphenyl		C12H10	92-52-4	154.2			0.7	0.5	8.23

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Borneol		C10H18O	507-70-0	154.2			0	0.9	~9
Bromine		Br2	7726-95-6	159.8	59	0.1	0	1.3	10.55
Bromoacetone		C3H5BrO	598-31-2	137			0	0.9	9.73
Bromoacetylene		C2HBr	593-61-3	104.9			0	4.1	10.31
Bromobenzene		C6H5Br	108-86-1	157			0.3	0.3	8.98
Bromobutane, 1-	1-Butyl bromide	C4H9Br	109-65-9	137	102		14.1	1.7	10.13
Bromobutane, 2-	Sec-Butyl bromide	C4H9Br	78-76-2	137			1.5	0.9	10.01
Bromo-2-chloroethane, 1-		C2H4BrCl	107-04-0	143.4			0	3.1	~10.5
Bromocyclohexane		C6H11Br	108-85-0	163.1			0	1.9	9.87
Bromo-2,2-dimethylpropane, 1-		C5H11Br	630-17-1	151			0	1.9	10.04
Bromoethane	Ethyl bromide	C2H5Br	74-96-4	109		5	NR	1.7	10.29
Bromoethanol, 2-		C2H5BrO	540-51-2	125			0	1.9	10.0
Bromoethyl methyl ether, 2-		C3H7OBr	6482-24-2	139			0	0.84	10.0
Bromoform	Tribromomethane	CHBr3	75-25-2	252.7	149	0.5	0	2.5	10.48
Bromo-2-methylpentane, 1-		C6H13Br	25346-33-2	165.1			0	2.1	10.09
Bromopentane, 1-		C5H11Br	110-53-2	151			3.4	1	10.10
Bromopropane, 1-	n-Propyl bromide	C3H7Br	106-94-5	123	71	10	150	1.5	10.18
Bromopyridine, 3-		C5H4BrN	626-55-1	158			0	2.1	9.75
Bromopyridine, 4-		C5H4BrN	1120-87-2	158			0	2.1	9.94
Bromotrimethylsilane		C3H9BrSi	2857-97-8	153.1			2.2	2	10.0
Butadiene diepoxide, 1,3-		C4H6O2	298-18-0	86.1			25	3.5	~10
Butadiene, 1,3-	Butadiene	C4H6	106-99-0	54.1	-4	1	0.8	0.85	9.07
Butane, i-	Isobutane	C4H10	106-97-8	58.1			NR	0	10.68
Butane, n-		C4H10	106-97-8	58.1	-1	1000	NR	0 (~50)	10.53
Butanediol, 2,3-		C4H10O2	513-85-9	90.1			15.1	5.1	10.26
Butanedione, 2,3-	Diacetyl, Biacetyl	C4H6O2	431-03-8	86.1			0.8	0.8	9.56
Butanoic acid	Butyric acid	C4H8O2	107-92-6	88.1			0	4.9	10.17
Butanol, 1-	Butyl alcohol	C4H10O	71-36-3	74.1	118	20	70	4.7	10.04
Butanol, 2-		C4H10O	78-92-2	74.1			8.1	3.1	10.10
Butanol, t-	2-Methyl-2-propanol	C4H10O	75-65-0	74.1	82	100	6.9	2.9	9.90
Butene, 1-	1-Butylene	C4H8	106-98-9	56.1		250	0	1.6	9.58
Butene, 2-	2-Butylene	C4H8	107-01-7	56.1		250	0	1.4	9.10
Butenenitrile, 3-		C4H5N	109-75-1	67.1			0	2.9	10.20
Butenoic acid, 3-		C4H6O2	107-93-7	86.1			0	2.1	9.75
Buten-3-ol, 1-		C4H8O	598-32-3	72.1			3.1	1.9	9.50
Butoxyethanol, 2-	Ethylene glycol monbutyl ether, Butyl Cellosolve, EGBE.	C6H14O2	111-76-2	118.2	171	20	1.8	1.2	8.68
Butoxyethoxyethanol	Diethylene glycol monobutyl ether	C8H18O3	112-34-5	162.2		5	13.1	3.1	~9
Butoxyethyl acetate, 2-	EGBEA, Ethylene glycol butyl ether acetate	C8H16O3	112-07-2	160.2		20	4.1	2.1	
Butyl acetate, n-		C6H12O2	123-86-4	116.6	126	50	0	2.6	
Butyl acetate, sec-		C6H12O2	105-46-4	116.2		50	5	1.7	
Butyl acrylate, n-		C7H12O2	141-32-2	128.2	145	2	0	1.6	~9.6
Butylamine, n-		C4H11N	109-73-9	73.1	78	C5	1.1	1.1	8.71
Butylamine, sec-		C4H11N	513-49-5	73.1		2	0	1	8.70
Butylamine, t-		C4H11N	75-64-9	73.1			1.4	1.1	8.64
Butylbenzene, n-		C10H14	104-51-8	134.2		10	0.5	0.6	8.69
Butylbenzene, sec-		C10H14	135-98-8	134.2			0.5	0.5	8.68
Butylbenzene, t-		C10H14	98-06-6	134.2			0.5	0.5	8.69
Butyl butyrate		C8H16O2	109-21-7	144.2			0	1.9	~9.7
Butyl Cellosolve	See Butoxyethanol								
Butyl chloroformate		C5H9ClO2	592-34-7	136.6		0.2	0	3.1	~10.4
Butylcyclohexanol, 4-t-		C10H20O	98-52-2	156.3			0	1.5	~9
Butylcyclohexyl acetate, 2-t-		C12H22O2	88-41-5	198			0	1	~10

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Butyl diglycol acetate		C10H20O4	124-17-4	204.3	243		0	2.9	~10
Butylene carbonate, 1,2-		C5H8O3	4437-85-8	116.1			NR	18.1	~10.4
Butyl ether, n-		C8H18O	142-96-1	130.2			1.2	0.9	9.28
Butyl glycidyl ether		C7H14O2	2426-08-6	130.2		5	0	1.9	~10.0
Butyl hydroperoxide, t-		C4H10O2	75-91-2	90.1		1	2	1.6	
Butyl iodide		C4H9I	542-69-8	184			0	1.1	9.23
Butyl isocyanate		C5H9NO	111-36-4	99.1			0	2.4	10.14
Butyl lactate		C7H14O3	138-22-7	146.2		5	0	2.4	9.80
Butyl mercaptan	1-Butanethiol	C4H10S	109-79-5	90.2		0.5	0.55	0.52	9.15
Butyl mercaptan, t-		C4H10S	75-66-1	90.2			0.7	0.7	9.03
Butyl methacrylate		C8H14O2	97-88-1	142.2			0	1.1	~9.5
Butylphenol, o-s-		C10H14O	89-72-5	150.2		5	0	1	7.80
Butyl propionate, n-		C7H14O2	590-01-2	130.2			4.1	2	
But-2-ynal		C4H4O	1119-19-3	68.1			0	3.1	10.20
But-3-ynal		C4H4O	52844-23-2	68.1			0	1.6	9.85
Butyn-1-ol, 2-		C4H6O	764-01-2	70.1			0	1.6	9.78
Butyraldehyde	Butanal	C4H8O	123-72-8	72.1		20	1.8	1.6	9.86
Butyronitrile		C4H7N	109-74-0	69.1		8	NR	NR	~11.6
Butyryl chloride		C4H7ClO	141-75-3	106.5			0	3.1	~10.4
Carbon dioxide		CO2	124-38-9	44	-79	5000	NR	NR	13.77
Carbon disulfide		CS2	75-15-0	76.1	46	1	4	1.2	10.08
Carbon monoxide		CO	630-08-0	28	-192	25	NR	NR	14.01
Carbon suboxide		C3O2	504-64-3	68			0	10.1	10.60
Carbon tetrabromide	Tetrabromomerhane	CBr4	558-13-4	331.6	190		0	2.9	10.31
Carbon tetrachloride	R10;Tetrachloromethane	CCl4	56-23-5	153.8	77	5	NR	NR	11.47
Carbonyl fluoride		COF2	353-50-4	66	85	2	0	0	13.02
Carbonyl sulfide		COS	463-58-1	60.1	-50		0	0	11.08
Carene		C10H16	13466-78-9	136.2	171	20	0	0.6	8.40
Carvacrol	5-Isopropyl-2-methylphenol	C10H14O	499-75-2	150.2	238		0	0.9	~9
Carvone, R-		C10H14O	6485-40-1	150.2	231		1.6	1.7	9.77
Chloramine	Monochloramine	ClH2N	10599-90-3	51.5			0	1.9	9.85
Chlorine		Cl2	7782-50-5	70.9	-34	0.1	NR	NR	11.48
Chlorine dioxide		ClO2	10049-04-4	67.5		C0.1	NR	NR	10.57
Chloroacetaldehyde		C2H3OCl	107-20-0	78.5		C1	0	3.1	10.16
Chloroacetyl chloride		C2H2Cl2O	79-04-9	112.9		0.05	0	8.1	10.30
Chlorobenzene		C6H5Cl	108-90-7	112.6		10	0.44	0.4	9.07
Chlorobutane, 1-	n-Butyl chloride	C4H9Cl	109-69-3	92.6			0	10.1	10.64
Chlorobutane, 2-	s-Butyl chloride	C4H9Cl	78-86-4	92.6			0	6	10.57
Chlorocyclohexane		C6H11Cl	542-18-7	118.6			19.9	1.9	10.10
Chlorodifluoromethane	R22	CHClF2	75-45-6	86.5		1000	NR	NR	12.2
Chloroethane	Ethyl chloride	C2H5Cl	75-00-3	64.5		100	NR	NR	10.97
Chloroethanol, 2-		C2H5ClO	107-07-3	80.5		C1	0	9.9	10.52
Chloroethyl ether, 2-		C4H8Cl2O	111-44-4	143		5	8.6	3	
Chloroethyl methyl ether, 2-		C3H7ClO	627-42-9	94.5			0	2.5	10.25
Chloro-1-fluoroethane, 1-		C2H4ClF	1615-75-4	82.5			NR	NR	~11.7
Chloro-2-fluoroethane, 1-		C2H4ClF	762-50-5	82.5			NR	NR	~11.7
Chloroform	R20; Trichloromethane	CHCl3	67-66-3	119.4		10	NR	NR	11.37
Chloromethoxyethane	Chloromethyl ethyl ether	C3H7ClO	3188-13-4	94.5			0	4.1	10.30
Chloro-2-methylpropene, 3-		C4H7Cl	563-47-3	90.6			1.4	1.2	
Chloropentafluoroethane		C2ClF5	76-15-3	154.5			NR	NR	12.96
Chloropicrin		CCl3NO2	76-06-2	164.4		0.1	0	0	~11
Chloroprene	2-Chlorobuta-1,3-diene	C4H5Cl	126-99-8	88.5		10	0	1.4	8.79
Chloro-2-propanone, 1-	Chloroacetone	C3H5ClO	78-95-5	92.5		C1	0	1.1	9.92

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Chloropyridine, 2-		C5H4ClN	109-09-1	113.5			0	1.1	9.00
Chlorostyrene, o-		C8H7Cl	2039-87-4	138.6		50	0	0.5	~8.5
Chlorothiophene, 3-		C4H3ClS	17249-80-8	118.6			0.8	0.8	8.92
Chlorotoluene, m-		C7H7Cl	108-41-8	126.6			0	0.6	8.70
Chlorotoluene, o-		C7H7Cl	95-49-8	126.6		50	0	0.6	8.83
Chlorotoluene, p-		C7H7Cl	106-43-4	126.6			0.4	0.5	8.69
Chlorotrifluoroethene	R1113	C2ClF3	79-38-9	116.5		5	6.7	3.9	9.81
Chlorotrimethylsilane		C3H9ClSi	75-77-4	108.6	57		NR	0	10.83
Cinnamic aldehyde	Cinnamaldehyde	C8H8O	104-55-2	132.2	248		0	0.5	~9
Cinnamyl acetate		C11H12O2	21040-45-9	176.2			0	0.5	~9
Cinnamyl alcohol		C9H10O	104-54-1	134.2			0	0.5	~9
Citral	Geranial; Lemonal	C10H16O	5392-40-5	152.2	229		3.5	1.8	~8.7
Citronellal		C10H18O	106-23-0	154.2			0	1	~9
Citronellol		C10H20O	26489-01-0	156			0	1.1	~8.5
Citronellol acetate		C12H22O2	150-84-5	198.3			0	1.6	~9
Citronellol formate		C11H20O2	105-85-1	184.3			0	1.4	~9
Citronellyl isobutyrate		C14H26O2	97-89-2	226.4			0	0.8	~9
Clary propyl acetate		C11H20O3	131766-73-9	200			0	1.1	~9
Coumarin		C9H6O2	91-64-5	146.1			0	0.5	~9
Cresol methyl ether	Methoxytoluene	C8H10O	104-93-8	122.2	174		0	0.9	~9
Cresol, m-	3-Methylphenol	C7H8O	108-39-4	108.1	203	5	0.57	0.5	8.36
Cresol, o-	2-Methylphenol	C7H8O	95-48-7	108.1	191	5	1.6	1.2	8.14
Cresol, p-	4-Methylphenol	C7H8O	106-44-5	108.1	202	5	1.6	1.2	8.31
Cresyl acetate, p-		C9H10O2	140-39-6	150.2	211		0	1.1	8.60
Cresyl ethyl ether, p-	p-Ethoxytoluene	C9H12O	622-60-6	136.2	188		0	0.9	~9
Crotonaldehyde	2-Butenal; Methacrolein	C4H6O	123-73-9	70.1	104		1.5	1.1	9.73
Crotonyl alcohol	2-Butenol; But-2-en-1-ol	C4H8O	6117-91-5	72.1	121		0	0.9	9.13
Cumene	Isopropylbenzene	C9H12	98-82-8	120.2	152	50	0.58	0.54	8.73
Cyclobutanone		C4H6O	1191-95-3	70.1			0	1.1	9.35
Cyclobutene		C4H6	822-35-5	54.1			0	3.1	9.43
Cycloheptane		C7H14	291-64-5	98.2			0	1	9.82
Cyclohex-2-enedione, 1,4-		C6H6O2	4505-38-8	110.1			0	0.9	9.77
Cyclohexane		C6H12	110-82-7	84.2	81	100	3.3	1.4	9.98
Cyclohexanethiol		C6H12S	1569-69-3	116.2			0	0.6	~9
Cyclohexanol		C6H12O	108-93-0	100.2		50	1.5	0.94	10.00
Cyclohexanone		C6H10O	108-94-1	98.1	156	20	1	0.9	9.16
Cyclohexene		C6H10	110-83-8	82.1		20	0	0.8	8.95
Cyclohexyl acetate		C8H14O2	622-45-7	142.2			0	1.3	~9.5
Cyclohexylamine		C6H13N	108-91-8	99.2		10	21	2.9	8.37
Cyclooctadiene		C8H12	29965-97-7	108.2			1.2	1.1	~9.5
Cyclopentadiene		C5H6	542-92-7	66.1		75	0	0.9	8.56
Cyclopentane		C5H10	287-92-3	70.1		600	0	15	10.52
Cyclopentanone		C5H8O	120-92-3	84.1			0.9	0.8	9.26
Cyclopentene		C5H8	142-29-0	68.1			1.4	1.4	9.01
Cyclopentene-1,3-dione, 4-		C5H4O2	930-60-9	96.1			0	1.1	9.60
Cyclopropylamine		C3H7N	765-30-0	57.1			1.1	0.9	8.80
Cymene, p-	4-Isopropyltoluene	C10H14	99-87-6	134.2	177		0	0.5	8.29
Decahydronaphthalene	Decalin	C10H18	91-17-8	138.2		5	0	1	9.14
Decanal		C10H20O	112-31-2	156.3			0	1.1	~9
Decane		C10H22	124-18-5	142.3	174		4	1.4	9.65
Decenal, t-4-		C10H18O	65405-70-1	154.2			0	1.5	~9
Decene		C10H22	872-05-9	140.3		100	0	0.9	~9.5
Decyne, 1-		C10H18	764-93-2	138.2			0.8	0.4	9.91
Desflurane		C3H2F6O	57041-67-5	168			0	0	~11

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Diacetone alcohol		C6H12O2	123-42-2	116.2		50	0.8	0.8	~9.6
Diazine, 1,2-		C4H4N2	289-80-5	80.1			0	2.9	9.65
Diazine, 1,3-		C4H4N2	289-95-2	80.1			0	3.1	9.33
Dibromoacetylene		C2Br2	624-61-3	183.8			0	2.1	9.65
Dibromochloromethane		CHBr2Cl	124-48-1	208.3			0	5.3	10.59
Dibromo-3-chloropropane, 1,2-	DBCP	C3H5Br2Cl	96-12-8	236.3	198	0.001	0	1.7	~10.3
Dibromocyclohexane, 1,2-		C6H10Br2	5401-62-7	242			0	3.1	10.02
Dibromocyclopentane		C5H8Br2	33547-17-0	227.9			0	3.1	10.06
Dibromodichloromethane		CBr2Cl2	594-18-3	242.7			NR	4.1	10.40
Dibromodifluoromethane		CF2Br2	75-61-6	209.8			NR	3.1	11.07
Dibromoethane, 1,2-	EDB;Ethylene dibromide	C2H4Br2	106-93-4	187.9	131	0.045	NR	1.7	10.35
Dibromoethene, 1,1-	Vinylidene bromide	C2H2Br2	593-92-0	185.8			0	1.6	9.78
Dibromoethene, 1,2-		C2H2Br2	540-49-8	185.8			0	1.6	9.63
Dibromomethane	Methylene bromide	CH2Br2	74-95-3	173.8			NR	2	10.41
Di-n-butylamine		C8H19N	111-92-2	129.2		C5	4.1	6.1	
Dichloroacetylene		C2Cl2	7572-29-4	94.9		C0.1	0	5.1	9.9
Dichlorobenzene, m-		C6H4Cl2	541-73-1	147		2	0.6	0.6	9
Dichlorobenzene, o-		C6H4Cl2	95-50-1	147	180	25	0.54	0.47	9.06
Dichlorobenzene, p-		C6H4Cl2	106-46-7	147		10	0.6	0.5	9.06
Dichloro-1,3-butadiene, 1,4-		C4H4Cl2	2984-42-1	123			0	0.7	~9.5
Dichloro-2-butene, 1,4-		C4H7Cl	764-41-0	125		0.005	0	2.1	~9.5
Dichloro-2-butene, trans-1,4-		C4H7Cl	110-57-6	125			0	2.1	~9.5
Dichloro-1,1-difluoroethane, 1,2-		C2H2Cl2F2	1649-08-7	134.9			0	0	
Dichloro-1,2-difluoroethane, 1,2-		C2H2Cl2F2	431-06-1	134.9			0	0	
Dichloro-1,2-difluoroethene, 1,2-		C2Cl2F2	598-88-9	132.9			0	2.1	~10.2
Dichloro-2,2-difluoroethene, 1,1-	R-1112a	C2Cl2F2	79-35-6	132.9			0	0.9	9.69
Dichlorodimethylsilane	Dimethyldichlorosilane	C2H6Cl2Si	75-78-5	129.1		C2	0	0	
Dichloroethane, 1,1-	Ethylidene chloride	C2H4Cl2	75-34-3	99		100	0	0	11.06
Dichloroethane, 1,2-	Ethylene dichloride	C2H4Cl2	107-06-2	99		10	0	0	11.05
Dichloroethene, 1,1-	Vinylidene chloride	C2H2Cl2	75-35-4	96.9	32	5	0	0.82	10.00
Dichloroethene, 1,2-	1,2-Dichloroethylene	C2H2Cl2	540-59-0	96.9	49	200	0.3	0.3	9.65
Dichloroethene, c-1,2-	c-1,2-DCE	C2H2Cl2	156-59-2	96.9	60	200	0	0.9	9.66
Dichloroethene, t-1,2-	t-1,2-DCE	C2H2Cl2	156-60-5	96.9	49	200	0	0.45	9.65
Dichloro-1-fluoroethane, 1,1-	R-141B	C2H3Cl2F	1717-00-6	117		500	0	0	>11.0
Dichloro-1-fluoroethane, 1,2-		C2H3Cl2F	430-57-9	117			0	0	>11.0
Dichloromethane	Methylene chloride	CH2Cl2	75-09-2	84.9			0	0	11.32
Dichloropropane, 1,2-		C3H6Cl2	78-87-5	113			0	0	10.87
Dichloro-1-propene, 1,3-		C3H4Cl2	542-75-6	111		1	1.3	0.96	<10
Dichloro-1-propene, 2,3-		C3H4Cl2	78-88-6	111			1.9	1.3	<10
Dichloro-1,1,1-trifluoroethane, 2,2-	R-123	C2HCl2F3	306-83-2	152.9		50	NR	NR	11.5
Dichloro-2,4,6-trifluoropyridine, 3,5-		C5Cl2F3N	1737-93-5	202			1.1	0.9	
Dichlorvos		C4H7Cl2O4P	62-73-7	221	74	0.1	0	0.9	<9.4
Dicyclohexylamine		C12H23N	101-83-7	181.3			0	1	~8.5
Dicyclopentadiene	Cyclopentadiene dimer	C10H12	77-73-6	132.2	170	5	0.57	0.48	~8
Diesel fuel #2, whole		------	68334-30-5	216	200-350	14	1.3	0.7	
Diethoxyethane, 1,1-		C6H14O2	105-57-7	118.2			1.1	1.7	9.78
Diethylacetylene		C6H10	928-49-4	82.1			0	1.9	10.03
Diethylamine		C4H11N	109-89-7	73.1		5	0	0.97	8.01
Diethylaminoethanol, 2-		C6H15ON	100-37-8	117.2		2	0	2.8	8.58
Diethylaminopropylamine, 3-		C7H18N2	104-78-9	130.2			3.1	5	~9
Diethyl carbonate		C5H10O3	105-58-8	118.1			0	7.1	~10.3
Diethylene glycol monoethyl ether	DGMEE	C6H14O3	111-90-0	134.2			0	0.7	~9
Diethylenetriamine		C4H13N3	111-40-0	103.2		1	0	1.1	~8.5

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Diethylhydroxylamine		C4H11NO	3710-84-7	89.1		2	1.6	1.6	~9
Diethyl maleate		C8H12O4	141-05-9	172.2			0	2.1	~10
Diethyl malonate		C7H12O4	105-53-3	160.2			0	3.9	10.20
Diethyl phosphite		C4H11O3P	762-04-9	138.1			0	1.9	10.31
Diethylsilane		C4H12Si	542-91-6	88.2			0	2.1	
Diethyl sulfate		C4H10SO4	64-67-5	154.2		Skin 2	0	3.1	~10.5
Diethyl sulfone		C4H10O2S	597-35-3	122.2			0	2.1	9.96
Diglycidyl ether	DGE	C6H10O3	2238-07-5	130		0.1	0	2.9	~9.6
Diglyme	Methoxyethyl ether	C6H14O3	111-96-6	134.2			0.64	0.54	<9.8
Dihydroeugenol		C10H14O2	2785-87-7	166.2			0	0.5	~9
Dihydroisojasmone		C11H18O	95-41-0	262			0	0.8	~9
Dihydrojasmone		C11H18O	1128-08-1	166.3			0	0.7	~9
Dihydromyrcenol		C10H20O	18479-58-8	156.3			0	0.9	~9
Dihydroxybenzene, 1,2-	Catechol	C6H6O2	120-80-9	110.1		5	0	0.9	8.56
Dihydroxybenzene, 1,3-	Resorcinol	C6H6O2	108-46-3	110.1		10	0	0.9	8.63
Diiodomethane	Methylene iodide	CH2I2	75-11-6	267.8			0	1.3	9.46
Diisobutylene		C8H16	107-39-1	112.2		75	0.8	0.6	8.91
Diisobutyl ketone	2,6-Dimethyl-4-heptanone	C9H18O	108-83-8	142.2		25	0.6	0.7	9.04
Diisopropylamine		C6H15N	108-18-9	101.2		5	0.84	0.74	7.73
Diisopropylbenzene		C12H18	25321-09-9	162.3			0	0.6	~8.8
Diisopropyl ether		C6H14O	108-20-3	102.2			0.9	0.6	9.20
Diketene		C4H4O2	674-82-8	84.1			2.6	2	9.60
Dimethoxybenzene, 1,4-		C8H10O2	150-78-7	138.2			0	1.2	~9
Dimethoxymethane	Formal, Methylal	C3H8O2	109-87-5	76.1		1000	13.1	2.9	10.0
Dimethylacetamide, N,N-	DMA	C4H9NO	127-19-5	87.1		10	0.87	0.8	8.81
Dimethylacetylene		C4H6	503-17-3	54.1			0	1.1	9.58
Dimethylamine		C2H7N	124-40-3	45.1		5	0	1.4	8.23
Dimethylaminoethanol, 2-		C4H11NO	108-01-0	89.1			0	1.4	8.8
Dimethylaniline, N,N-		C8H11N	121-69-7	121.2		5	0.6	0.7	7.12
Dimethylboron bromide		C2H6BBr	5158-50-9	120.8			0	4.1	10.25
Dimethylbutyl acetate, 1,3-	s-Hexyl acetate	C8H16O2	108-84-9	144.2			0	1.7	~9.5
Dimethyl carbonate		C3H6O3	616-38-6	90.1			NR	~70	10.52
Dimethylcycloheptane, 1,2-		C9H18	13151-50-3	126.2			0	1.4	10.21
Dimethylcyclohexane, 1,2-		C8H16	583-57-3	112.2			1	0.6	9.41
Dimethylcyclopentane		C7H14	1192-18-3	98.2			0	1.3	9.92
Dimethyl disulfide		C2H6S2	624-92-0	94.2		0.5	0.2	0.2	8.46
Dimethylethylamine	DMEA	C4H11N	598-56-1	73.1			1.1	1	7.74
Dimethylformamide, N,N-	DMF	C3H7NO	68-12-2	73.1	153	5	0.7	0.7	9.13
Dimethylhydrazine, 1,1-	UDMH	C2H8N2	57-14-7	60.1	63	0.01	0	0.78	7.28
Dimethyl methylphosphonate	DMMP	C3H9O3P	756-79-6	124.1	181		0	4.3	9.94
Dimethyloctan-1-ol, 3,7-		C10H22O	106-21-8	158.3			0	1.3	~9.5
Dimethyloctan-3-ol, 3,7-		C10H22O	78-69-3	158.3			0	1.1	~9.5
Dimethylpentane, 2,4-		C7H16	108-08-7	100.2			0	1.1	~9.8
Dimethyl phosphite		C2H7O3P	868-85-9	110			NR	7.9	10.53
Dimethyl phthalate		C10H10O4	131-11-3	194.2	284		0	0.9	9.64
Dimethylsilane		C2H8Si	1111-74-6	60.2			NR	1.9	10.30
Dimethyl sulfate		C2H6O4S	77-78-1	126.1		0.1	23	20	~12
Dimethyl sulfoxide	DMSO	C2H6OS	67-68-5	78.1			0	1.4	9.10
Dimethylthiophosphoryl chloride		C2H6ClO2PS	2524-03-0	160.6			0	1.1	
Dioxane, 1,4-		C4H8O2	123-91-1	88.1		20	1.8	1.5	9.19
Dioxolane, 1,3-		C3H6O2	646-06-0	74.1		20	4	2.3	~9.6
Dipentene	Limonene	C10H16	138-86-3	136.2	176	30	0.9	1	~8.6
Diphenyl ether	Diphenyl oxide	C12H10O	101-84-8	170.2	259		1.8	1.6	8.09
Di-n-propylamine		C6H15N	142-84-7	101.2			1.6	1.6	7.80

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Dipropyl ether		C6H14O	111-43-3	102.2			0	1.1	9.30
Dipropylene glycol		C6H14O3	110-98-5	134.2	231		0	4.1	~10
Disilane		Si2H6	1590-87-0	62.2			0	1.9	9.74
Disulfur dibromide		S2Br2	13172-31-1	223.9	47		0	1.6	9.23
Disulfur dichloride		S2Cl2	10025-67-9	135			0	2.9	9.4
Di-tert-butyl-p-cresol	BHT	C15H24O	128-37-0	220.4	265		0	0.4	7.80
Divinylbenzene		C10H10	1321-74-0	130	195	10	0.7	0.8	~8.2
Divinylbenzene, 1,3-		C10H10	108-57-6	130.2	195		0.7	0.7	~8.3
Dodecene		C12H24	112-40-3	170.3			0	1.1	~9
DS-108F Wipe Solvent	Ethyl lactate/IsoparH/ Propoxypropanol ~7:2:1	C5H10O3	97-64-3	118.1			3.3	1.6	
Epichlorohydrin		C2H5ClO	106-89-8	92.5	118	0.5	0	8.5	10.2
Epoxypropyl isopropyl ether, 2,3-		C6H12O2	4016-14-2	116.2			1.2	1.3	~9
Estragole		C10H12O	140-67-0	148.2			0	0.8	~9
Ethane		C2H6	74-84-0	30.1	-89	1000	0	0	11.52
Ethanol	Ethyl alcohol	C2H6O	64-17-5	46.1	78	1000	0	10	10.47
Ethanolamine	2-Aminoethanol	C2H7NO	141-43-5	61.1		3	5.6	1.6	8.96
Ethene	Ethylene	C2H4	74-85-1	28.1	-128	200	0	9	10.51
Ethoxybutane, 2-		C6H14O	19316-73-5	104.1			0	0.9	9.32
Ethoxyethanol, 2-	Ethyl Cellosolve, EGEE	C4H10O2	110-80-5	90.1		5	5.1	2.1	9.6
Ethoxyethyl acetate, 2-	Cellosolve acetate, EGEEA	C6H12O3	111-15-9	132.2		5	0	2.9	~9.5
Ethoxy-2-methylpropane, 1-		C6H14O	627-02-1	102.2			0	0.9	9.3
Ethoxy-2-propanol, 1-		C5H12O2	1569-02-4	104.1			0	2.5	~9.5
Ethoxypropyl acetate		C7H14O3	98516-30-4	146		20	0	1.1	~9.5
Ethyl acetate		C4H8O2	141-78-6	88.1	77	400	0	4.6	10.01
Ethyl acetoacetate		C6H10O3	141-97-9	130.1			3.1	2.6	~9.5
Ethylacetylene	1-Butyne	C4H6	107-00-6	54.1			0	2.9	10.18
Ethyl acrylate		C5H8O2	140-88-5	100.1	99	5	0	2.4	<10
Ethylamine		C2H7N	75-04-7	45.1		5	0	0.8	8.86
Ethylbenzene		C8H10	100-41-4	106.2	136	20	0.52	0.52	8.77
Ethyl benzoate		C9H10O2	93-89-0	150.2			0	1	8.90
Ethyl t-butyl ether		C6H14O	637-92-3	102.2		25	0	0.9	9.39
Ethyl butyrate		C6H12O2	105-54-4	116.2			3.4	1.5	~9.8
Ethyl chloroformate		C3H5O2Cl	541-41-3	108.5			0	79	10.64
Ethyl cyanoacrylate	Ethyl-2-cyanoacrylate	C6H7O2N	7085-85-0	125		0.2	0	1.6	~10
Ethylcyclohexane		C8H16	1678-91-7	112.2			1.4	0.9	~9.5
Ethyl decanoate	Ethyl caprate	C12H24O2	110-38-3	200.3	245		0	1.9	~9.6
Ethylenediamine	1,2-Diaminoethane	C2H8N2	107-15-3	60.1	116	10	0.9	0.8	8.6
Ethylene glycol	1,2-Ethanediol	C2H6O2	107-21-1	62.1	197	10	0	16	10.16
Ethylene glycol dimethyl ether	Dimethoxyethane;Glyme	C4H10O2	110-71-4	90.1	85		1.1	0.86	9.2
Ethylene oxide	Oxirane	C2H4O	75-21-8	44.1	11	1	0	13	10.57
Ethyl ether		C4H10O	60-29-7	74.1	35	400	0	1.1	9.51
Ethyl 3-ethoxypropionate		C7H14O3	763-69-9	146.2		100	1.2	0.75	
Ethyl formate		C3H6O2	109-94-4	74.1		100	0	34	10.61
Ethyl hexanoate		C8H16O2	123-66-0	144.2			3.4	1.7	
Ethylhexanol, 2-		C8H18O	104-76-7	130.2		10	0	1.6	~9.8
Ethylhexyl acrylate,2-		C11H20O2	103-11-7	184.3	216	5	0	1.1	~9
Ethylidenenorbornene		C9H12	16219-75-3	120.2		2	0.43	0.39	≤8.8
Ethyl iodide	Iodoethane	C2H5I	75-03-6	156			0.4	0.4	9.34
Ethyl isopropyl ketone		C6H12O	565-69-5	100.2			0	0.9	9.1
Ethyl (S)-(-)-lactate	Ethyl lactate	C5H10O3	687-47-8	118.1			13	3.2	~10
Ethyl mercaptan	Ethanethiol	C2H6S	75-08-1	62.1	35	0.5	0.6	0.56	9.29
Ethyl methacrylate		C6H10O2	97-63-2	114.1			1.5	1	
Ethyl 2-methylbutyrate		C7H14O2	7452-79-1	130.2			1.9	1.5	

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Ethyl methyl carbonate		C4H8O3	623-53-0	104.1			NR	19	10.4
Ethyl octanoate	Ethyl caprylate	C10H20O2	106-32-1	172.3	207		0	2.4	~9.7
Ethyl perfluorobutyl ether		C6H5F9O	163702-05-4	264.1	50		NR	NR	~11
Ethyl phenyl acetate		C10H12O2	101-97-3	164.2			0	1.3	~9
Ethyl propanoate		C5H10O2	105-37-3	102.1			6.1	2.6	10.01
Ethyl sulfide	Diethyl sulfide	C4H10S	352-93-2	90.2			0	0.51	8.43
Ethyl 2,2,2-trifluoroethyl ether		C4H7F3O	461-24-5	128.1			0	5.1	~10.4
Eucalyptol		C10H18O	470-82-6	154.2			0	0.7	~9
Eugenol		C10H12O2	97-53-0	164.2			0	0.5	~9
Fluorine		F2	7782-41-4	38		0.1	NR	NR	15.70
Fluoro-2-propanone, 1-		C3H5FO	430-51-3	76.1			0	0	9.92
Fluorobenzene		C6H5F	462-06-6	96.1			0.8	0.7	9.20
Fluorobenzoic acid, 4-		C7H5FO2	456-22-4	140.1			0	2.1	9.91
Formaldehyde		CH2O	50-00-0	30		0.1	NR	NR	10.87
Formamide		CH3NO	75-12-7	45		1	0	6.9	10.20
Formic acid		CH2O2	64-18-6	46		5	0	0	11.05
Furan		C4H4O	110-00-9	68.1		0.02	0	0.5	8.88
Furfural		C5H4O2	98-01-1	96.1		0.2	0	0.92	9.21
Furfuryl alcohol		C5H6O2	98-00-0	98.1		0.2	0	0.8	~8.5
Furfuryl mercaptan	Furan-2-ylmethanethiol	C5H6OS	98-02-2	114.1	155		0.9	0.9	~8.5
Gasoline		------	8006-61-9	93	35-200	300	1.3	1	
Geranial	Citral A; E-Citral	C10H16O	141-27-5	152.2	229		0	0.5	~8.7
Geraniol		C10H18O	106-24-1	154.2	230		0	0.8	~9
Geranyl acetate		C12H20O2	105-87-3	196.3	245		0	1.3	~9
Glutaraldehyde	1,5-Pentandial	C5H8O2	111-30-8	100.1	187	C0.05	1.1	0.8	
Glycidol	2,3-Epoxy-1-propanol	C3H6O2	556-52-5	74.1	167	2	0	0	~10.8
Glycidyl methacrylate		C7H10O3	106-91-2	142.2	189	0.5	0	1.1	~10
Glycolaldehyde	3-Hydroxybutanal	C2H4O2	141-46-8	60.1	131		0	4.9	~10.4
Glyoxal	Ethanedial	C2H2O2	107-22-2	58	51	0.1	0	0.9	10.2
Guaiacol	2-Methoxyphenol	C7H8O2	90-05-1	124.1	205		0	0.9	~8
Halothane	Fluothane	CF3CHBrCl	151-67-7	197.4	50	50	NR	NR	11.0
Heptan-2-one	Methyl n-amyl ketone	C7H14O	110-43-0	114.2	151	50	1	0.9	9.33
Heptan-3-one	Ethyl butyl keton	C7H14O	106-35-4	114.2	146	50	0.9	0.8	9.02
Heptan-4-one	Dipropyl ketone; DPK	C7H14O	123-19-3	114.2	144	50	0.9	0.8	9.10
Heptane, n-		C7H16	142-82-5	100.2	98	400	45	2.8	9.92
Heptanol		C7H16O	53535-33-4	116.2			0	1.8	~9.8
Heptene, 1-		C7H14	592-76-7	98.2			1.2	0.9	9.34
Heptylcyclopentan-1-one, 2-		C12H22O	137-03-1	182.3			0	0.9	~9
Heptyne, 1-		C7H12	628-71-7	96.2			0	1.9	10.04
Hex-1-en-3-ol		C6H12O	4798-44-1	100.2			0	1	~9
Hexachlorodisilane		Cl6Si2	13465-77-5	268.9	144		0	8.1	~10.4
Hexachloroethane	Perchloroethane	C2Cl6	67-72-1	236.7	187	1	NR	NR	11.22
Hexafluoropropylene	Perfluoropropene	C3F6	116-15-4	150	-28	0.1	NR	0	10.60
Hexamethyldisilazane, 1,1,1,3,3,3-	HMDS (v. reactive)	C6H19NSi2	999-97-3	161.4	127	10	~0.5	0.24	~8.6
Hexamethyldisiloxane		C6H18OSi2	107-46-0	162.4			~0.35	0.3	9.64
Hexamethylene diisocyanate		C8H12N2O2	822-06-0	168.2		0.005	0	1.4	~9
Hexamethyleneimine		C6H13N	111-49-9	99.2			0	1	8.41
Hexan-2-one		C6H12O	591-78-6	100.2			0.8	0.9	9.34
Hexane, n-		C6H14	110-54-3	86.2	68	50	350	4.3	10.13
Hexanoic acid		C6H12O2	142-62-1	116.2			0	4.1	10.12
Hexanol, 1-		C6H14O	111-27-3	102.2	157		9	2.5	9.89
Hexene, 1-		C6H12	592-41-6	84.2		50	1.2	1	9.44
Hexenyl acetate, cis-3-		C8H14O2	3681-71-8	142.2			1.3	1.1	~9

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Hexenyl butyrate, cis-3-		C10H18O2	16491-36-4	170.2			0	1.6	~9
Hexylaldehyde	Hexanal	C6H12O	66-25-1	100.2	129		1.9	1.3	9.72
Histoclear	d-Limonene	C10H16	5989-27-5	136.2	179	5	0.5	0.4	~8.8
Hydrazine		H4N2	302-01-2	32	114	0.01	8	3	~8.9
Hydrogen		H2	1333-74-0	2	-253		NR	NR	15.43
Hydrogen chloride		HCl	7647-01-0	36.5	-85	C2	NR	NR	12.74
Hydrogen cyanide		HCN	74-90-8	27	26	C4.7	NR	NR	13.60
Hydrogen fluoride		HF	7664-39-3	20	20	0.5	NR	NR	15.98
Hydrogen iodide		HI	10034-85-2	127.9	-35		0	0.6	10.39
Hydrogen selenide		H2Se	7783-07-5	81	-41	0.05	0	2.1	9.88
Hydrogen sulfide		H2S	7783-06-4	34.1	-60	1	0	3.3	10.46
Hydrogen telluride		H2Te	7783-09-7	129.6	-2		0	2.1	9.14
Hydroxybutanal, 3-		C4H602	107-89-1	88.1			0	2.1	~9.5
Hydroxycitronellal		C10H20O2	107-75-5	172.3			0	1.1	~9
Hydroxyethyl acrylate		C5H8O3	818-61-1	116.1			0	1.3	~10
Hydroxylamine		H3NO	7803-49-8	33			0	2.1	10.00
Hydroxynonyl acetate		C11H22O3	1322-17-4	202			0	1.5	~9.5
Hydroxypropyl acrylate, 2-		C6H10O3	999-61-1	130		0.5	0	1.6	~9
Indene		C9H8	95-13-6	116.2		5	0.5	0.6	8.81
Indole		C8H7N	120-72-9	117.1			0	0.5	7.76
Iodine		I2	7553-56-2	253.8	184	0.015	0.1	0.1	9.31
Iodobenzene		C6H5I	591-50-4	204			0	0.3	8.73
Iodoethene	Vinyl iodide	C2H3I	593-66-8	153.9			0	1.3	9.30
Iodoform		CHI3	75-47-8	393.7		0.2	0	1.6	9.25
Iodomethane	Methyl iodide	CH3I	74-88-4	141.9	42	2	0.21	0.22	9.54
Isoamyl acetate		C7H14O2	123-92-2	130.2			10.1	2.1	~9.7
Isobornyl acetate		C12H20O2	125-12-2	196.3			0	0.6	~9
Isobutane	2-Methylpropane	C4H10	75-28-5	58.1	-12	1000	NR	**8**	10.47
Isobutanol		C4H10O	78-83-1	74.1	108	50	19	3.8	10.02
Isobutyl acetate		C6H12O2	110-19-0	116.2			9.9	1.9	9.9
Isobutyl acrylate		C7H12O2	106-63-8	128.2			0	1.5	~9.5
Isobutylamine		C4H11N	78-81-9	73.1			3.1	1.1	8.70
Isobutylbenzene		C10H14	538-93-2	134.2			0.5	0.5	8.68
Isobutylene	2-Methylpropene	C4H8	115-11-7	56.1	-7	250	1	1	9.24
Isobutylene epoxide		C4H8O	558-30-5	72.1			0	3.1	10.0
Isobutyraldehyde		C4H8O	78-84-2	72.1		25	0	1.1	9.74
Isobutyric acid		C4H8O2	79-31-2	88.1			15.1	4.5	10.24
Isodecanol		C10H22O	25339-17-7	158			0	1	~9.8
Isodihydrolavandulal		C10H18O	35158-25-9	154.2			~0.9	0.8	~9
Isoeugenol		C10H12O2	97-54-1	164.2	266		0	0.5	~9
Isoflurane		C3H2ClF5O	26675-46-7	184.5	49	5	NR	NR	~11
Isoheptane		C7H16	591-76-4	100.2			0	1.1	9.84
Isomenthone		C10H18O	1196-31-2	154.2			0	0.7	9.86
Isononanal		C9H18O	5435-64-3	142.2			1.5	1	~9.6
Isononanol		C9H20O	3452-97-9	144.3			0	1.4	~9.8
Isooctane	2,2,4,Trimethylpentane	C8H18	540-84-1	114.2	99		3.3	1.2	9.86
Isooctanol	Isooctyl alcohol	C8H18O	26952-21-6	130		50	0	1.6	~9.8
Isopar E Solvent		------	64741-66-8	121			1.7	0.8	
Isopar G Solvent		------	64742-48-9	148			0	0.79	~9.5
Isopar K Solvent		------	64742-48-9	156			0.85	0.53	
Isopar L Solvent		------	64742-48-9	163			0.86	0.52	
Isopar M Solvent		------	64742-47-8	191			0	0.66	~9.5
Isopentane	2-Methylbutane	C5H12	78-78-4	72.1			0	4.1	10.32
Isopentanol		C5H12O	137-32-6	88.1			5.9	1.9	9.86

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Isopentene	2-Methyl-1-butene	C5H10	563-46-2	70.1			0	0.9	9.12
Isophorone		C9H14O	78-59-1	138.2		2	1.1	0.9	9.07
Isophorone diisocyanate		C12H18N2O2	4098-71-9	222	~320	0.005	0	0.7	~9
Isoprene	2-Methyl-1,3-butadiene	C5H8	78-79-5	68.1	34	2	0.69	0.63	8.85
Isopropanol	Isopropyl alcohol, IPA	C3H8O	67-63-0	60.1	83	200	500	6	10.12
Isopropanolamine		C3H9NO	78-96-6	75.1			0	1.6	~9.6
Isopropoxyethanol, 2-	Ethylene glycol isopropyl ether	C5H12O2	109-59-1	104.1		25	1.6	1.3	
Isopropoxyethyl acetate		C7H14O2	19234-20-9	146			0	1.3	~9.5
Isopropyl acetate		C5H10O2	108-21-4	102.1		100	8.1	2.5	9.99
Isopropylamine		C3H9N	75-31-0	59.1		5	0.9	0.9	8.72
Isopropylaminoethanol, 2-		C5H13NO	109-56-8	103.2			0	1.9	~9
Isopropyl chloroformate		C4H7O2Cl	108-23-6	122.6			0	1.7	~10.2
Isopropylcyclohexane		C9H18	696-29-7	126.2			1.2	0.8	9.33
Isopropyl nitrite		C3H7NO2	541-42-4	89.1			0	3.9	10.23
Isothiazole		C3H3NS	288-16-4	85.1			0	2.9	9.55
Isovaleraldehyde		C5H10O	590-86-3	86.1			1.6	1.4	9.72
Isovaleric acid		C5H10O2	503-74-2	102.1			26	5.6	~10.2
Jasmone, cis-		C11H16O	488-10-8	164.2			0	0.6	~9
Jet fuel JP-4		------	------	115	70-240		0	1	~9
Jet fuel JP-5		------	------	167	180-270	29	0	0.6	~9
Jet fuel JP-8		------	------	165	170-270	30	0	0.6	~9
Jet fuel TS		------	------	165		30	0.9	0.6	~9
Kerosene		------	8008-20-6	170		29	0.8	0.9	~9
Ketene		C2H2O	463-51-4	42			0	2.9	9.62
Limonene, D-	Histoclear	C10H16	5989-27-5	136.2	179	5	0	0.33	~8.8
Linalool oxide		C10H18O2	14049-11-7	170.2			0	0.7	~9
Linalyl acetate		C12H20O2	115-95-7	196.3			0	1.2	~9
Maleic anhydride	2,5-Furandione	C4H2O3	108-31-6	98.1	202	0.0025	0	1.9	9.90
Menthol		C10H20O	1490-04-6	156.3			0	0.6	~9
Menthone		C10H18O	89-80-5	154.2			0	0.5	~9
Mercaptoacetic acid		C2H4O2S	68-11-1	92.1			0	0.9	~9.8
Mesitylene	1,3,5-Trimethylbenzene	C9H12	108-67-8	120.2	165	25	0.36	0.35	8.41
Metaldehyde		C8H16O4	108-62-3	176.2			0	1.9	~9.7
Methacrylamide		C4H7NO	79-39-0	85.1			0	1.9	~10
Methacrylic acid		C4H6O2	79-41-4	86.1		20	0	2.4	10.15
Methacrylonitrile		C4H5N	126-98-7	67.1			0	4.9	10.34
Methane	Natural gas	CH4	74-82-8	16	-162	1000	NR	NR	12.61
Methanol	Methyl alcohol	CH4O	67-56-1	32	65	200	NR	NR	10.85
Methoxy-1-butanol, 3-		C5H12O2	2517-43-3	104.1			0	2.9	~9.5
Methoxybutyl acetate, 3-		C7H14O3	4435-53-4	146.2			0	1.9	~9.5
Methoxy-2,2-dimethylpropane, 1-		C6H14O	1118-00-9	102.2			0	1	9.3
Methoxyethane	Methyl ethyl ether	C3H8O	540-67-0	60.1			0	0.9	9.72
Methoxyethanol, 2-	Methyl Cellosolve, EGME	C3H8O2	109-86-4	76.1		0.1	4.8	2.4	9.6
Methoxyethene	Methyl vinyl ether	C3H6O	107-25-5	58.1			0	0.9	8.95
Methoxyethoxy ethanol, 2-		C7H16O3	111-77-3	120.1	194		2.3	1.2	
Methoxyethyl acetate, 2-		C5H10O3	110-49-6	118.1		0.1	7.9	4.9	
Methoxyethyl acrylate, 2-		C6H10O3	3121-61-7	130.1	156		2.5	1.4	
Methoxymethylethoxy-2-propanol		C7H16O3	34590-94-8	148.2			0	1.2	9.3
Methoxypropane, 2-	Methyl propyl ether	C4H10O	598-53-8	74.1			0	1.3	9.45
Methoxy-1-propanol, 2-		C4H10O2	1589-47-5	90.1		50	0	1.9	~9.6
Methyl acetate		C3H6O2	79-20-9	74.1	57	200	0	6.6	10.27

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Methyl acetoacetate		C5H8O3	105-45-3	116.1			0	2.9	9.81
Methyl acrylate		C4H6O2	96-33-3	86.1		2	0	3.7	10.25
Methylamine	Aminomethane	CH5N	74-89-5	31.1		5	0	1.4	8.97
Methyl anthranilate	Methyl 2-aminobenzoate	C8H9NO2	134-20-3	151.2	256		0	0.5	~9
Methyl benzoate		C8H8O2	93-58-3	136.1			0	1.3	9.32
Methyl bromide	Bromomethane	CH3Br	74-83-9	94.9	4	1	110	1.7	10.54
Methylbutan-1-ol, 3-	Isoamyl alcohol	C5H12O	123-51-3	88.1	131		10.1	2.4	9.8
Methylbutanal, 2-		C5H10O	96-17-3	86.1			1.4	1.3	~9.7
Methyl t-butyl ether	MTBE	C5H12O	1634-04-4	88.1	55	50	0	0.91	9.24
Methylbutyric acid, 2-	Isopentanoic acid	C5H10O2	116-53-0	102.1			21	6.1	
Methyl chloride	Chloromethane	CH3Cl	74-87-3	50.5		50	NR	NR	11.22
Methyl chloroformate		C2H3O2Cl	79-22-1	94.5		0.2	NR	NR	11.36
Methyl cyanoacrylate		C5H5O2N	137-05-3	111.1		2	NR	NR	10.98
Methylcyclohexane		C7H14	108-87-2	98.2		400	1.6	0.97	9.64
Methylcyclohexanol		C7H14O	25639-42-3	114.2		50	0	2.5	~9.8
Methylcyclopentane		C6H12	96-37-7	84.2			0	1.6	9.85
Methyldichloramine	N,N-Dichloromethylamine	CH3Cl2N	7651-91-4	99.9			0	2.1	9.5
Methyl-3,3-dimethacrylate	Methy 3-methyl-2-butenoate	C6H10O2	924-50-5	114.1			0	2.6	~9.5
Methylene chloride	Dichloromethane	CH2Cl2	75-09-2	84.9		25	NR	NR	11.32
Methyl ether	Dimethyl ether	C2H6O	115-10-6	46.1	-24	1000	4.8	3.1	10.03
Methyl ethyl ketone	MEK; 2-Butanone	C4H8O	78-93-3	72.1	80	200	0.86	0.86	9.51
Methyl ethyl ketone peroxide	MEKP	C8H18O6	1338-23-4	146			0	0.9	~9.5
Methyl formate		C2H4O2	107-31-3	60.1		50	NR	NR	10.82
Methyl heptyne carbonate		C9H14O2	111-12-6	154.2			0	1.2	~9
Methylhydrazine	Monomethylhydrazine	CH6N2	60-34-4	46.1	87	0.01	1.4	1.2	7.7
Methyl ionone		C14H22O	1335-46-2	192.3	127		0	0.5	~9
Methyl isobutyl ketone	MIBK	C6H12O	108-10-1	100.2	117	20	0.9	0.8	9.30
Methyl Isocyanate		C2H3NO	624-83-9	57.1	40	0.02	0	4.6	10.67
Methyl isopropyl ketone	MIPK	C5H10O	563-80-4	86.1	94	20	0.9	0.9	9.31
Methyl isothiocyanate		C2H3NS	556-61-6	73.1	119	IDLH3	0.5	0.45	9.25
Methyl mercaptan	Methanethiol	CH3SH	74-93-1	48.1	6	0.5	0.65	0.54	9.44
Methyl methacrylate	MMA	C5H8O2	80-62-6	100.1	101	50	2.7	1.5	9.7
Methylpentan-2-ol, 4-		C6H14O	108-11-2	102.2			2.9	1.3	~9.8
Methylpentane, 2-		C6H14	107-83-5	86.2			33	2.9	10.12
Methyl perfluorobutyl ether	HFE-7100DL	C5H3F9O	163702-07-6	250.1			NR	NR	~11
Methyl phenethyl ether		C9H12O	3558-60-9	136.2			0	0.7	~7.7
Methyl phenylacetate		C9H10O2	101-41-7	150.2			0	0.5	~9
Methyl propargyl ether	3-Methoxy-1-propyne	C4H6O	627-41-8	70.1			0	2.1	9.78
Methyl propionate		C4H8O2	554-12-1	88.1			0	3.9	10.15
Methyl propyl ketone	MPK, 2-Pentanone	C5H10O	107-87-9	86.1		150	0	0.93	9.38
Methyl propynoate		C4H4O2	922-67-8	84.1			0	9.9	10.3
Methylpyrrole, N-		C5H7N	96-54-8	81.1			0.9	1	
Methyl-2-pyrrolidinone, N-	NMP	C5H9NO	872-50-4	99.1	202	10	1	0.8	9.17
Methyl salicylate		C8H8O3	119-36-8	152.1	222		1.3	0.9	7.65
Methylstyrene		C9H10	25013-15-4	118		10	0.6	0.6	8.18
Methyl sulfide	Dimethyl sulfide	C2H6S	75-18-3	62.1	37	10	0.49	0.44	8.69
Methyl thiocyanate		C2H3NS	556-64-9	73.1			3.1	2.1	9.96
Methyl thioglycolate		C3H6O2S	2365-48-2	106.1			3.9	1.9	~10
Methylundecanal, 2-		C12H24O	110-41-8	184.3			0	0.9	~9.5
Methyl vinyl ketone		C4H6O	78-94-4	70.1			0	0.7	9.65
Mineral spirits	Stoddard Solvent; White Spirits; Varsol	------	8020-83-5	144	130-200	100	1	0.71	
Morpholine		C4H9NO	110-91-8	87.1			2.1	4.1	~9
Myrcene	7-Methyl-3-methylene-1,6-octadiene	C10H16	123-35-3	136.2			0	0.6	~8.2

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Naphtha, heavy aromatic		------	64742-94-5	128.2			0	0.5	~9
Naphtha, light aromatic		------	64742-95-6	128.2			0	0.6	~9
Naphtha, medium aliphatic		------	64742-88-7	128.2			0	0.9	~10
Naphthalene		C10H8	91-20-3	128.2	218	10	0.45	0.42	8.14
Naphthol methyl ether, 2-		C11H10O	93-04-9	158.2			0	0.6	~8.5
Neopentane	2,2-Dimethylpropane	C5H12	463-82-1	72.1			0	2.9	10.21
Neopentyl alcohol	2,2-Dimethylpropanol	C5H12O	75-84-3	88.1			0	1.9	9.72
Nickel carbonyl in CO		C4O4Ni	13463-39-3	170.7		0.001	0	0.17	<8.8
Nitric oxide		NO	10102-43-9	30	-152	25	6	5.2	9.25
Nitrobenzene		C6H5NO2	98-95-3	123.1		1	2.6	1.9	9.81
Nitroethane		C2H5NO2	79-24-3	75.1		100	0	0	10.88
Nitrogen		N2	7727-37-9	28		Asphix	0	0	15.58
Nitrogen dioxide		NO2	10102-44-0	46	21	0.2	23	16	9.75
Nitromethane		CH3NO2	75-52-5	61		20	0	0	11.02
Nitropropane, 2-		C3H7NO2	79-46-9	89.1		10	0	0	10.71
N-Methylolacrylamide		C4H7NO2	924-42-5	101.1			0	1.9	~10.3
Nonanal		C9H18O	124-19-6	142.2			0	1.2	~9
Nonane		C9H20	111-84-2	128.3		200	4.6	1.3	9.72
Nonanol (mixed isomers)	Nonyl alcohol	C9H20O	143-08-8	144.3			0	1.3	~9.8
Nonene (mixed isomers)		C9H18	27215-95-8	126			0	0.7	~9.3
Nonene, 1-		C9H18	124-11-8	126.2			0	0.7	~9.4
Norbornadiene, 2,5-		C7H8	121-46-0	92.1			0.8	0.7	8.38
Norpar 12		------	64771-72-8	161			3.2	1.1	
Norpar 13		------	64771-72-8	189			2.7	1	
Octalactone, gamma-		C8H14O	104-50-7	142.2			0	2.9	~9
Octamethylcyclotetrasiloxane	D4	C6H12O4Si4	556-67-2	296.6	176		0.2	0.2	<9
Octamethyltrisiloxane		C8H24O2Si3	107-51-7	236.5	153		0.24	0.22	<9
Octane, n-		C8H18	111-65-9	114.2	125	300	13.2	1.8	9.82
Octanol (mixed isomers)		C8H18O	111-87-5	130.2			0	1.4	~9.8
Octene (mixed isomers)		C8H16	25377-83-7	112			0	0.8	9.4
Octene, 1-		C8H16	111-66-0	112.2			0.9	0.75	9.42
Oxalyl bromide		C2Br2O2	15219-34-8	215.8			0	4.9	10.49
Oxydiethanol, 2,2′-	Diethylene glycol, DEG	C4H10O3	111-46-6	106.1	245	10	0	1.9	~9
Oxygen		O2	7782-44-7	32	-186	NA	NR	NR	12.07
Ozone		O3	10028-15-6	48	-112	0.05	NR	NR	12.52
Paraldehyde		C6H12O3	123-63-7	132.2			4.9	2.3	~9.7
Pentacarbonyl iron		FeC5O5	13463-40-6	195.9			0	1.1	~8
Pentanal	Pentyl aldehyde	C5H10O	110-62-3	86.1			1.8	1.6	9.74
Pentandione, 2,4-	Acetyl acetone	C5H8O2	123-54-6	100.1		25	0.9	1.3	8.85
Pentane		C5H12	109-66-0	72.1	36	1000	80	8.4	10.35
Pentanoic acid		C5H10O2	109-52-4	102.1			52.1	8.1	10.53
Pentanol, 2-	Pentyl alcohol	C5H12O	6032-29-7	88.1		20	16.1	2.1	9.78
Pentanol, 3-	Pentyl alcohol	C5H12O	584-02-1	88.1		20	3.6	1.8	9.76
Pentan-3-one	Diethyl ketone	C5H10O	96-22-0	86.1		200	0.8	0.8	9.31
Pentene, 1-		C5H10	109-67-1	70.1			1.1	1	9.49
Pentylcyclopentan-1-one, 2-		C10H18O	4819-67-4	154			0	1.1	~9
Pentylcyclopentane		C10H20	3741-00-2	140.3			0	1	9.91
Pentyne, 1-		C5H8	627-19-0	68.1			0	3.1	10.1
Peracetic acid		C2H4O3	79-21-0	76.1		STEL0.4	NR	NR	~11
Perchloroethene	Tetrachloroethylene, PCE	C2Cl4	127-18-4	165.8	121	25	0.69	0.57	9.32
Perchloryl fluoride		Cl03F	7616-94-6	102.5			NR	NR	13.6
Perfluorobutadiene		C4F6	685-63-2	162			0	2.9	9.50
Perfluorocyclobutane		C4F8	115-25-3	200			NR	NR	13.50
Perfluoropropane		C3F8	76-19-7	188			NR	NR	13.38

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Perfluoro-tert-butylamine		C4H2F9N	2809-92-9	235.1			0	4.9	10.40
Petroleum ether		------	8032-32-4	90.1			0	1	~10
PGME	Propylene glycol methyl ether	C4H12O2	107-98-2	90.1			2.4	1.5	
PGMEA	Propylene glycol methyl ether acetate	C6H12O3	108-65-6	132.2	146	50	1.65	1	
Phellandrene		C10H16	99-83-2	136.2			0	0.9	~8.2
Phenol	Hydroxybenzene	C6H6O	108-95-2	94.1	182	5	1	1	8.51
Phenoxyethanol, 2-		C8H10O2	122-99-6	138.2			9.9	4.4	~8.5
Phenylacetaldehyde		C8H8O	122-78-1	120.1			0	0.6	8.80
Phenylacetic acid		C8H8O2	103-82-2	136.1			0	1.1	8.26
Phenyl chloroformate		C7H5ClO2	1885-14-9	156.6			0	1	~9
Phenylcyclohexane		C12H16	827-52-1	160.3			0	0.5	~9
Phenyl-2,3-epoxypropyl ether		C9H10O2	122-60-1	150.2			0	0.9	~8.6
Phenylethyl acetate, 1-		C10H12O2	93-92-5	164.2			0	0.8	~9
Phenylethyl alcohol	2-Phenyl-1-ethanol	C8H10O	60-12-8	122.2			0	1.3	~9
Phenyl ethyl isobutyrate, 2-		C12H16O2	103-48-0	192.3			0	1.4	~9
Phenylpropene, 2-	Alpha-methyl styrene	C9H10	98-83-9	118.2			0.5	0.5	~8.5
Phosgene	Carbonyl chloride	COCl2	75-44-5	98.9	9	0.1	NR	NR	11.55
Phosphine (coats lamp)		PH3	7803-51-2	34	-88	0.05	28	3.9	9.87
Phthalonitrile		C8H5N2	91-15-6	128.1			0	1.3	9.9
Picoline, 3-		C6H7N	108-99-6	93.1			0.9	0.8	9.04
Pine oil		------	8002-09-3	136			0	1.1	~9.5
Pinene, a-		C10H16	2437-95-8	136.2			0	0.31	8.07
Pinene, b-		C10H16	18172-67-3	136.2	166	20	0.38	0.37	8.10
Piperazine		C4H10N2	110-85-0	86.1		0.03	0	0.9	8.72
Piperidine		C5H11N	110-89-4	85.1		1	0.9	1.1	8.02
Piperylene, Isomer Mix	1,3-Pentadiene	C5H8	504-60-9	68.1	43	100	0.76	0.69	8.6
Propadiene		C3H4	463-49-0	40.1			0	0.9	9.83
Propanamide		C3H7NO	79-05-0	73.1			0	2.1	~9.5
Propane		C3H8	74-98-6	44.1	-42	1000	0	0	10.94
Propanol, n-	n-Propyl alcohol	C3H8O	71-23-8	60.1		100	40.1	5.5	10.22
Propanolamine		C3H9NO	156-87-6	75.1			0	1.6	~9.5
Propargyl chloride	3-Chloro-1-propyne	C3H3Cl	624-65-7	74.5			0	8.3	9.82
Propene	Propylene	C3H6	115-07-1	42.1	-48	500	1.5	1.4	9.73
Propen-1-imine, 2-		C3H5N	73311-40-7	55.1			0	1.9	9.65
Propiolic acid	2-Propynoic acid	C3H2O2	471-25-0	70			0	7.9	10.45
Propionaldehyde	Propanal, Propional	C3H6O	123-38-6	58.1		20	0	1.6	9.95
Propionic acid		C3H6O2	79-09-4	74.1		10	0	10.1	10.44
Propionitrile		C3H5NO	107-12-0	55.1		6	0	0	11.5
Propoxy-2-propanol, 1-		C6H14O2	1569-01-3	118.2			1.7	1.3	~9.5
Propyl acetate, n-		C5H10O2	109-60-4	102.1		100	18	3.1	10.04
Propylamine, n-	1-Aminopropane	C3H9N	107-10-8	59.1			1.1	1.1	8.5
Propylbenzene		C9H12	103-65-1	120.2			0.5	0.4	8.72
Propylbenzene (all isomers)		C9H12	74296-31-4	120			0	0.6	8.7
Propyl butanoate		C7H14O2	105-66-8	130.2			2.8	1.4	
Propylene carbonate		C4H6O3	108-32-7	102.1			0	0	~10.5
Propylene glycol	1,2-Dihydroxypropane	C3H8O2	57-55-6	76.1	188	3	18	5.5	
Propyleneimine	2-Methylaziridine	C3H7N	75-55-8	57.1	67	0.2	1.5	1.25	9.0
Propylene oxide	Methyloxirane	C3H6O	16088-62-3	58.1	34	2	0	6.6	10.22
Propyl formate		C4H8O2	110-74-7	88.1			0	20	10.54
Propyl iodide	Iodopropane	C3H7I	107-08-4	170			0	0.9	9.26
Propyl mercaptan	Propanethiol	C3H8S	107-03-9	76.2		C0.5	1	1.1	9.20
Propyl mercaptan, 2-	2-Propanethiol	C3H8S	75-33-2	76.2			0.64	0.66	9.15
Propylnitrate, n-		C3H7NO3	627-13-4	105.1		25	NR	NR	11.07
Propyne	Methylacetylene	C3H4	74-99-7	40.1		1000	0	4.1	

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Prop-2-yn-1-ol	Propargyl alcohol	C3H4O	107-19-7	56.1		1	0	3.8	10.5
Pyrazine	1,4-Diazabenzene	C4H4N2	290-37-9	80.1	115		0	3.1	9.29
Pyridine	Azabenzene	C5H5N	110-86-1	79.1	115	1	0.78	0.68	9.25
Pyridinol, 4-		C5H5NO	626-64-2	95.1			0	2.9	9.75
Pyridylamine, 2-		C5H6N2	504-29-0	94.1			0	0.9	8.10
Pyrrole	Azole, Imidole	C4H5N	109-97-7	67.1	130		1	1.3	8.02
Pyrrolidine (Coats Lamp)	Azacyclopentane	C4H9N	123-75-1	71.1	87		2.1	1.3	8.77
Pyruvaldehyde		C3H4O2	78-98-8	72.1			0	0.8	9.6
Rose oxide, cis-		C10H18O	16409-43-1	154.2			0	0.7	~9
Sevoflurane		C3H3F7O	28523-86-6	200.1	59		NR	NR	~11
Silane	Silicon terahydride	SiH4				5	NR	NR	11.0
Stibine	Antimony trhidride	SbH3	7803-52-3	124.8			0	1.4	9.89
Styrene	Vinylbenzene	C8H8	100-42-5	104.1	145	20	0.45	0.4	8.43
Sulfur dichloride		Cl2S	10545-99-0	103			0	2.1	9.47
Sulfur dioxide		SO2	7446-09-5	64.1	-10	STEL0.25	NR	NR	12.30
Sulfur hexafluoride		SF6	2551-62-4	146.1			NR	NR	19.30
Sulfur tetrafluoride		SF4	7783-60-0	108.1		C0.1	NR	NR	12.63
Terpineol, a-		C10H18O	98-55-5	154.2	217		0	0.7	~9
Terpinolene		C10H16	586-62-9	136.2			1	0.7	8.1
Terpinyl acetate, a-		C12H20O2	80-26-2	196.3	220		0	1.3	~9
Terpinyl methyl ether		C11H20O	14576-08-0	168			0	0.6	~9
Tetrabromoethane, 1,1,2,2-		C2H2Br4	79-27-6	345.7	244	0.1	0	1.9	~10
Tetrachloroethane, 1,1,1,2-	R-130a	C2H2Cl4	630-20-6	167.8	131		NR	NR	~11.1
Tetrachloroethane, 1,1,2,2-	R-130	C2H2Cl4	79-34-5	167.8	147	1	NR	NR	~11.1
Tetrachloropyridine, 2,3,5,6-		C5HNCl4	2402-79-1	216.9	252	0.6	0	0.9	~9
Tetrachlorosilane		SiCl4	10026-04-7	169.9		C1	NR	NR	11.79
Tetraethyllead	TEL	C8H20Pb	78-00-2	323.4	85	0.008	NR	NR	~11.1
Tetraethyl orthosilicate	Ethyl silicate, TEOS	C8H20O4Si	78-10-4	208.3	169	10	0	0.71	9.77
Tetrafluoroethylene	R-1114	C2F4	116-14-3	100		2	0	16	10.12
Tetrafluoromethane	Carbon tetrafluoride	CF4	75-73-0	88			NR	NR	15.3
Tetrahydrofuran	THF	C4H8O	109-99-9	72.1	66	50	1.9	1.7	9.41
Tetrahydronaphthalene	Tetralin	C10H12	119-64-2	132.2		2	0	0.5	8.46
Tetrahydropyran		C5H10O	142-68-7	86.1			1.6	1.6	9.25
Tetrahydrothiophene	Thiolane, THT	C4H8S	110-01-0	88.2		50	0.6	0.8	8.38
Tetramethylbenzene (all isomers)	Durene (1,2,4,5 isomer)	C10H14	95-93-2	134.2	192		0	0.4	8.16
Tetramethylbutane, 2,2,3,3-		C8H18	594-82-1	114.2			0	1.1	9.8
Tetramethyldisiloxane, 1,1,3,3-		C4H14OSi2	3277-26-7	134.32			1	0.8	~9
Tetramethylgermane		C4H12Ge	865-52-1	132.8			0	1.9	9.34
Tetramethylguanidine, N,N,N',N'		C5H13N3	80-70-6	115.2	163		0	0.7	8.43
Tetramethyl orthosilicate	Methyl silicate, TMOS	C4H12O4Si	681-84-5	152.2	122	1	10	1.9	
Tetramethylsilane	TMS	C4H12Si	75-76-3	88.2			0	2.1	9.80
Tetramethyl succinonitrile		C8H12N2	3333-52-6	136.2		0.09	0	0	~11
Therminol VP-1	Dowtherm A, 3:1 Diphenyl oxide:Biphenyl	$C_{12}H_{10}O$ & $C_{12}H_{10}$	101-84-8 & 92-52-4	165.8	257	1	0	0.4	~9
Thioacetic acid		C2H4OS	507-09-5	76.1			0	1.9	10.0
Thioanisole	Phenyl methyl sulfide	C7H8S	100-68-5	124.2			0.8	0.7	7.94
Thiocarbonyl fluoride		CSF2	420-32-6	82.1			0	6.1	10.45
Thiocyanogen		C2S2N2	505-14-6	116.2			0	7.9	10.5
Thioformaldehyde trimer		C3H6S3	291-21-4	138.3			0	1.6	9.35
Thiophene		C4H4S	110-02-1	84.1			0.5	0.5	8.86
Thiophosgene		CSCl2	463-71-8	115			0	1.1	9.61
Thymol		C10H14O	89-83-8	150.2			0	0.8	~9
Titanium-n-propoxide		C12H28O4Ti	3087-37-4	284.2			0	3.1	~9
Toluene	Methylbenzene	C7H8	108-88-3	92.1	111	20	0.54	0.5	8.82

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Toluenesulfonyl chloride, p-		C7H7SO2Cl	98-59-9	190.6			0	3.1	~9
Toluidine, o-	o-Methylaniline	C7H9N	95-53-4	107.2		2	0	0.6	7.40
Tolylaldehyde, p-		C8H8O	104-87-0	120.1			0	0.9	9.33
Tolylene-2,4-diisocyanate	TDI	C9H6N2O2	584-84-9	174.2	251	0.001	1.4	1.4	~8.8
Triazine, 1,3,5-		C3H3N3	290-87-9	81.1			0	6.1	10.01
Tributyl phosphate		C12H27O4P	126-73-8	266.3		0.2	0	5.1	8.91
Tributylamine		C12H27N	102-82-9	185.3			0	0	7.40
Trichlorobenzene, 1,2,4-		C6H3Cl3	120-82-1	181.4		C5	0.7	0.46	9.04
Trichloroethane, 1,1,1-		C2H3Cl3	71-55-6	133.4		350	NR	NR	11
Trichloroethane, 1,1,2-		C2H3Cl3	79-00-5	133.4		10	NR	NR	11.0
Trichloroethene	TCE; Trichloroethylene	C2HCl3	79-01-6	131.4	87	10	0.62	0.54	9.47
Trichloro-2-fluoroethane, 1,1,2-	R-131	C2H2Cl3F	359-28-4	151.4			NR	NR	~11
Trichloromethylsilane		CH3Cl3Si	75-79-6	149.5			0	0	
Trichloropropane, 1,2,3-		C3H5Cl3	96-18-4	147.4			NR	NR	~11
Trichlorotrifluoroethane, 1,1,1-	R-113a	C2Cl3F3	354-58-5	187.4			NR	NR	11.50
Trichlorotrifluoroethane, 1,1,2-	R-113	C2Cl3F3	76-13-1	187.4			NR	NR	11.99
Triethylaluminum		C6H15Al	97-93-8	114.2			0	1.1	~10
Triethylamine		C6H15N	121-44-8	101.2	89	0.5	0.95	0.9	7.53
Triethylbenzene		C12H18	25340-18-5	162		5	0	0.5	~8.3
Triethyl borate		C6H15O3B	150-46-9	146			0	2.2	10.13
Triethyl phosphate		C6H15O4P	78-40-0	182.2		1	50	3.1	9.79
Triethyl phosphite		C6H15O3P	122-52-1	166.2			0	1.4	8.30
Triethyl silane		C6H16Si	617-86-7	116.3			0	2.1	9.50
Trifluoroethane, 1,1,2-	R-143	C2H3F3	430-66-0	84			NR	NR	12.9
Trifluoroethanol, 2,2,2-		C2H3F3O	75-89-8	100		0.3	NR	NR	~12
Trifluoroethene	Trifluoroethylene, TFE	C2HF3	359-11-5	82			0	5.1	10.14
Trifluoroethyl methyl ether, 2,2,2-		C3H5F3O	460-43-5	114.1			0	10.1	10.53
Trifluoroiodomethane		CF3I	2314-97-8	195.9		500	0	2.1	10.28
Trimethoxymethane		C4H10O3	149-73-5	106.1			10.1	4.1	9.50
Trimethoxyvinylsilane		C5H12O3Si	2768-02-7	148.2			0	2.1	~9.5
Trimethylamine		C3H9N	75-50-3	59.1		5	0.6	0.6	7.82
Trimethylbenzene mixtures	Mesitylene	C9H12	25551-13-7	120		25	0.4	0.4	8.41
Trimethylbenzene, 1,2,4-		C9H12	95-63-6	120.2		25	0.7	0.7	8.39
Trimethyl borate		C3H9O3B	121-43-7	103.9			0	5.1	10.0
Trimethylcyclohexane, 1,2,4-		C9H18	2234-75-5	126.2			0	1.1	9.35
Trimethylene oxide		C3H6O	503-30-0	58.1			0	1.6	9.65
Trimethyl phosphate		C3H9O4P	512-56-1	140.1			0	8	9.99
Trimethyl phosphite		C3H9O3P	121-45-9	124.1		2	0	1.1	~9
Trimethylsilane		C3H10Si	993-07-7	74.2			0	1.1	9.9
Trioxane	Formaldehyde trimer	C3H6O3	110-88-3	90.1			0	2.1	10.3
Tropathiane		C8H16OS	67715-80-4	160			0	0.56	~9
Turpentine	Pinenes and other diisoprenes	C10H16	8006-64-2	136.2	90-115	20	0.4	0.3	
Undecane		C11H24	1120-21-4	156.3			3	1	9.56
Vanillin		C8H8O3	121-33-5	152.1			0	1.1	~9
Vinyl actetate		C4H6O2	108-05-4	86.1		10	1.5	1.2	9.19
Vinyl bromide	Bromoethylene	C2H3Br	593-60-2	106.9			1	1.6	9.82
Vinyl chloride	Chloroethylene	C2H3Cl	75-01-4	62.5	-13	1	0	2	9.99
Vinyl-1-cyclohexene, 4-		C8H12	100-40-3	108.2	129	0.1	0.6	0.56	8.93
Vinylene carbonate	1,3-Dioxol-2-one	C3H2O3	872-36-6	86			5.1	3.6	10.08
Vinyl ethyl ether		C4H8O	109-92-2	72.1			0.99	1.1	8.98
Vinyl fluoride	Fluoroethylene	C2H3F	75-02-5	46		1	0	2.1	10.36
Vinylidene difluoride	Vinylidene fluoride	C2H2F2	75-38-7	64		500	0	5.1	10.29
Vinyl-2-pyrrolidinone, 1-	NVP	C6H9NO	88-12-0	111.1	94	0.05	1	0.8	9.0

Compound Name	Synonyms	Formula	CAS No.	m.w.	b.p.	TWA* ppm	CF @ 9.8 eV	CF @ 10.6 eV	IE (eV)
Vinylsilane		C2H6Si	7291-09-0	58.2			0	1.4	10.10
Xylene mixed isomers	Dimethylbenzene	C8H10	1330-20-7	106.2	140	100	0.49	0.44	8.56
Xylene, m-	m-Dimethylbenzene	C8H10	108-38-3	106.2	139	100	0.5	0.44	8.56
Xylene, o-	o-Dimethylbenzene	C8H10	95-47-6	106.2	144	100	0.56	0.46	8.56
Xylene, p-	p-Dimethylbenzene	C8H10	106-42-3	106.2	138	100	0.48	0.39	8.44
Xylidine mixed isomers		C8H11N	1300-73-8	121.2			0.5	0.6	7.50

* TWA taken as ACGIH 8-hr value wherever available. A few of these are AIHA WEELs, NIOSH RELs, or German MAKs. C = Ceiling, STEL = Short Term Exposure Limit. NA = Not Available.