MiniPID Response Factors (10.6 eV). Ver. 1 May 2008

MiniPID HI or MiniPID LO photoionisation cells are calibrated using isobutylene, but PID is a broadband VOC detection technique, with a sensitivity that differs for each VOC. If you know what VOC you are measuring, then the table below will allow you to calculate the concentration for your specific VOC. Remember, these are approximate values, so for best accuracy you should calibrate with the relevant VOC.

The table includes six columns:

1 **Gas/ VOC** The most common name for the VOC. If you can not find the name of your VOC of concern, then email us at info@ionscience.com and we will help.

2 **CAS No.** Sometimes it is easier to identify a VOC from the internationally recognised CAS No.: ask your supplier.

3 **Formula** To further assist in identifying the VOC, this also is helpful in identifying its molecular weight, from which ppm measurements can be converted to say, mg/m^3 measurements.

4 **Response Factor (RF)** also known as corretion factor. Multiply the output response from the cell by the RF to provide a normalised scale of VOC concentration.

5 **Relative sensitivity (%)** This is the inverse of the correction factor, specifying the percent response of the VOC, relative to isobutylene. If less than 100%, then the VOC is less responsive than isobutylene; if the relative sensitivity is greater than 100%, then the VOC is more responsive than isobutylene. Relative sensitivity (%) is specified the same way as cross-sensitivity for toxic gas sensors.

6 **Minimum Detection Level (MDL)** or **Minimum Detectable Quantity (MDQ).** Typical lowest concentration that can be detected. The Mini PID HI has greater sensitivity than the Mini PID LO, so MDL's for the Mini PID HI are much lower.

The RF is measured in dry air; high humidity will reduce this factor by 10% to 20%, so the RF should be increased in high humidities.

VOC response

The PID can not measure all VOCs or gases. Two types of VOCs are not measured:

ZR: No response. The 10.6 eV lamp does not ionise the VOC and the VOC can not be measured.

NV: The vapour pressure of the VOC at 20°C is less than a few ppm, so this Semi-Volatile Organic Compound can not be measured.

Frequently you will be measuring a mixture of VOCs. If the total concentration is within the linear range of your PID, then it is reasonable to assume that the concentrations are additive without interference between the different VOCs. Remember that if you are measuring a combination of VOCs, then accurate measurement of one of these VOCs will be difficult; without careful data analysis, you will get only a CF averaged measurement. Be cautious when reporting actual VOC concentration if you know that there may be several VOCs present.

Balance gas

The relative response is measured in laboratory air, with 20.9% oxygen, balance nitrogen. Some gases absorb UV light (oxygen, methane), so in gases where there are significant concentrations of oxygen or methane, the apparent concentration will be less than is actually present. Methane absorbs UV strongly, so for accurate measurements in methane, calibrate with your target VOC in the expected methane concentration. 50% LEL methane reduces reading by up to 50%.Gases such as nitrogen and helium do not absorb UV and do not affect the relative response.

Accuracy of the Table

This table is for indication only. The values are only accurate within the linear range of the sensor (to 300 ppm), although this linear range may vary somewhat for specific gases. Table accuracy is to 1 or 2 digits only, so when calculating concentration for a specific VOC, specify to 1 or 2 digits only. For best accuracy, calibrate using the specific VOC, as advised in the 'MiniPID user guide'.

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Gas/ VOC	CAS No.	Formula	Relative response	Relative sensitivity (%)	Typical MDL Mini PID HI (ppb)	Typical MDL Mini PID LO (ppb)
Acetaldehyde	75-07-0	C2H4O	4.9	21	25	480
Acetic Acid	64-17-7	C2H4O2	36	3	180	3615
Acetic Anhydride	108-24-7	C4H6O3	4.0	25	20	400
Acetone	67-64-1	C3H6O	0.7	140	5	70
Acetonitrile	75-05-8	CH3CN	ZR			
Acetylene	74-86-2	C2H2	ZR			
Acrolein	107-02-8	C3H4O	4.0	25	20	400
Acrylic Acid	79-10-7	C3H4O2	2.7	36	15	275
Acrylonitrile	107-13-1	C3H3N	ZR			
Allyl alcohol	107-18-6	C3H6O	2.1	48	10	200
Allyl chloride	107-05-1	C3H5Cl	4.5	22	20	450
Ammonia	7664-41-7	H3N	8.5	12	40	850
Amyl acetate, n-	628-63-7	C7H14O2	1.8	56	10	180
Amyl alcohol	71-41-0	C5H12O	3.2	31	15	320
Aniline	62-53-3	C6H7N	0.5	200	3	50
Anisole	100-66-3	C7H8O	0.5	211	2	50
Arsine	7784-42-1	AsH3	2.5	40	15	250
Asphalt, petroleum fumes	8052-42-4		1.0	100	5	100
Benzaldehyde	100-52-7	C7H6O	0.9	117	5	85
Benzene	71-43-2	C6H6	0.5	200	3	50
Benzenethiol	108-98-5	C6H5SH	0.7	143	4	70
Benzonitrile	100-47-0	C7H5N	0.7	141	4	70
Benzyl alcohol	100-51-6	C7H8O	1.3	80	6	125
Benzyl chloride	100-44-7	C7H7Cl	0.6	182	3	55
Benzyl formate	104-57-4	C8H8O2	0.8	130	5	77
Biphenyl	92-52-4	C12H10	0.4	250	2	40
Bis(2,3-epoxypropyl) ether	2238-07-5	C6H10O3	3.0	33	15	300
Boron trifluoride	7637 07 2	BF3	ZR			
Bromine	7726-95-6	Br2	20	5	100	2000
Bromine pentafluoride	7789-30-2	BrF5	ZR			
Bromobenzene	108-86-1	C6H5Br	0.7	143	4	70
Bromochloromethane	74-97-5	CH2ClBr	ZR			
Bromoethane	74-96-4	C2H5Br	5.0	20	25	500
Bromoethyl methyl ether, 2-	6482-24-2	C3H7OBr	2.5	40	15	250
Bromoform	75-25-2	CHBr3	2.8	36	15	280
Bromopropane, 1-	106-94-5	C3H7Br	1.3	77	7	130
Bromotrifluoromethane	75-63-8	CF3Br	ZR			
Butadiene	106-99-0	C4H6	0.8	120	4	80
Butadiene diepoxide, 1,3-	1464-53-5	C4H6O2	4.0	25	20	400
Butane, n-	106-97-8	C4H10	46	2	230	4600
Butanol, 1-	71-36-3	C4H10O	4.0	25	20	400
Buten-3-ol, 1-	598-32-3	C4H8O	1.2	87	6	115
Butene, 1-	106-98-9	C4H8	1.3	77	7	130
Butoxyethanol, 2-	111-76-2	C6H14O2	1.1	91	6	110
Butyl acetate, n-	123-86-4	C6H12O2	2.4	41	10	240
Butyl acrylate, n-	141-32-2	C7H12O2	1.5	67	8	150
Butyl lactate	138-22-7	C7H14O3	2.5	40	15	250
Butyl mercaptan	109-79-5	C4H10S	0.5	185	3	50
Butylamine, 2-	513-49-5	C4H11N	0.9	111	5	90
Butylamine, n-	109-73-9	C4H11N	1.0	100	5	100
Camphene	565-00-4	C10H16	0.5	222	2	45
Carbon dioxide	124-38-9	CO2	ZR			

Gas/ VOC	CAS No.	Formula	Relative response	Relative sensitivity (%)	Typical MDL Mini PID HI (ppb)	Typical MDL Mini PID LO (ppb)
Carbon disulfide	75-15-0	CS2	1.4	71	7	140
Carbon monoxide	630-08-0	CO	ZR			
Carbon tetrabromide	558-13-4	CBr4	3.0	33	15	300
Carbon tetrachloride	56-23-5	CCl4	ZR			
Carbonyl sulphide	463-58-1	COS	ZR			
Carvone, R-	6485-40-1	C10H14O	1.0	100	5	100
Chlorine	7782-50-5	Cl2	ZR			
Chlorine dioxide	10049-04-4	ClO2	1.0	100	5	100
Chlorine trifluoride	7790-91-2	ClF3	ZR			
Chloro-1,1,1,2-tetrafluoroethane	2837-89-0	C2HClF4	ZR			
Chloro-1,1,1-trifluoroethane, 2-	75-88-7	C2H2ClF3	ZR			
Chloro-1,1,2,2-tetrafluoroethane	354-25-6	C2HClF4	ZR			
Chloro-1,1,2-trifluoroethane, 1-	421-04-5	C2H2ClF3	ZR			
Chloro-1,1-difluoroethane, 1-	75-68-3	C2H3ClF2	ZR			
Chloro-1,1-difluoroethane, 1-	75-68-3	C2H3ClF2	ZR			
Chloro-1,1-difluoroethane, 2-	338-65-8	C2H3ClF2	ZR			
Chloro-1,2,2-trifluoroethane	431-07-2	C2H2ClF3	ZR			
Chloro-1,3-butadiene, 2-	126-99-8	C4H5Cl	3.2	30	16	320
Chloro-1-fluoroethane, 1-	1615-75-4	C2H4ClF	ZR			
Chloro-2-fluoroethane, 1-	762-50-5	C2H4ClF	ZR			
Chloroacetaldehyde	107-20-0	C2H3OCl	ZR			
Chlorobenzene	108-90-7	C6H5Cl	0.5	220	2	50
Chlorodifluoromethane	75-45-6	CHClF2	ZR			
Chloroethane	75-00-3	C2H5Cl	ZR			
Chloroethanol 2-	107-07-3	C2H5ClO	10.0	10	50	1000
Chloroethyl methyl ether, 2-	627-42-9	C3H7ClO	2.6	40	13	250
Chlorofluoromethane	593-70-4	CH2ClF	ZR			
Chloroform	67-66-3	CHCl3	ZR			
Chloromethane	74-87-3	CH3Cl	ZR			
Chloropentafluoroethane	76-15-3	C2ClF5	ZR			
Chlorotoluene, o-	95-49-8	C7H7Cl	0.5	220	2	50
Chlorotoluene, p-	108-41-8	C7H7Cl	0.5	200	3	50
Chlorotrifluoroethylene	79-38-9	C2ClF3	1.0	100	5	100
Chlorotrifluoromethane	75-72-9	CClF3	ZR			
Citral	5392-40-5	C10H16O	1.0	100	5	100
Citronellol	26489-01-0	C10H20O	1.0	100	5	100
Cresol, m-	108-39-4	C7H8O	1.1	95	5	105
Cresol, o-	95-48-7	C7H8O	1.1	95	5	105
Cresol, p-	106-44-5	C7H8O	1.1	95	5	105
Crotonaldehyde	4170-30-3	C4H6O	1.0	100	5	100
Cumene	98-82-8	C9H12	0.6	170	3	60
Cyanamide	420-04-2	CH2N2	ZR			
Cyanogen bromide	506-68-3	CNBr	ZR			
Cyanogen chloride	506-77-4	CNCl	ZR			
Cyclohexane	110-82-7	C6H12	1.3	77	7	130
Cyclohexanol	108-93-0	C6H12O	2.9	34	15	300
Cyclohexanone	108-94-1	C6H10O	1.1	91	6	110
Cyclohexene	110-83-8	C6H10	0.8	133	5	75
Cyclohexylamine	108-91-8	C6H13N	1.0	102	5	100
Cyclopentane	287-92-3	C5H10	4.0	25	20	400
Decane, n-	124-18-5	C10H22	1.0	96	5	100
Diacetone alcohol	123-42-2	C6H12O2	0.8	125	5	80
Dibenzoyl peroxide	94-36-0	C14H10O4	0.8	125	5	80

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Gas/ VOC	CAS No.	Formula	Relative response	Relative sensitivity (%)	Typical MDL Mini PID HI (ppb)	Typical MDL Mini PID LO (ppb)
Diborane	19287-45-7	B2H6	ZR			
Dibromochloromethane	124-48-1	CHBr2Cl	10.0	10	50	1000
Dibromodifluoromethane	75-61-6	CF2Br2	ZR			
Dibromoethane 1,2-	106-93-4	C2H4Br2	2.0	50	10	200
Dibromotetrafluoroethane , 1,2-	124-73-2	C2F4Br2	ZR			
Dibutyl hydrogen phosphate	107-66-4	HC8H18 PO4	4.0	25	20	400
Dichloro-1,1,1-trifluoroethane, 2,2-	306-83-2	C2HCl2F3	ZR			
Dichloro-1,1-difluoroethane, 1,2-	1649-08-7	C2H2Cl2F2	ZR			
Dichloro-1,2,2-trifluoroethane, 1,2-	354-23-4	C2HCl2F3	ZR			
Dichloro-1,2-difluoroethane, 1,2-	631-06-1	C2H2Cl2F2	ZR			
Dichloro-1-fluoroethane, 1,1-	1717-00-6	C2H3Cl2F	ZR			
Dichloro-1-fluoroethane, 1,1-	1717-00-6	C2H3Cl2F	ZR			
Dichloro-1-fluoroethane, 1,2-	430-57-9	C2H3Cl2F	ZR			
Dichloro-1-propene, 2,3-	78-88-6	C3H4Cl2	1.4	70	7	140
Dichloro-2,2,-difluoroethane, 1,1-	79-35-6	C2H2Cl2F2	ZR			
Dichloroacetylene	7572-29-4	C2Cl2	5.0	20	25	500
Dichlorobenzene o-	95-50-1	C6H4Cl2	0.5	200	3	50
Dichlorodifluoromethane	75-71-8	CCl2F2	ZR			
Dichloroethane 1,2-	107-06-2	C2H4Cl2	ZR			
Dichloroethane, 1,1-	75-34-3	C2H4Cl2	ZR			
Dichloroethene, 1,1-	75-35-4	C2H2Cl2	1.0	105	5	100
Dichloroethene, cis-1,2-	156-59-2	C2H2Cl2	0.8	125	4	80
Dichloroethene, trans-1,2-	540-59-0	C2H2Cl2	0.7	143	4	70
Dichloroethylene 1,2-	540-59-0	C2H2Cl2	0.8	133	4	75
Dichlorofluoromethane	75-43-4	CHFCl2	ZR			
Dichloromethane	75-09-2	CH2Cl2	39	3	200	3900
Dichloropropane, 1,2-	78-87-5	C3H6Cl2	ZR			
Dichlorotetrafluoroethane, 1,1-	374-07-2	C2Cl2F4	ZR			
Dichlorotetrafluoroethane, 1,2-	76-14-2	C2Cl2F4	ZR			
Dicyclopentadiene	77-73-6	C10H12	0.9	110	5	90
Diesel Fuel	68334-30-5		0.8	130	4	75
Diethyl ether	60-29-7	C4H10O	0.9	110	4	90
Diethyl maleate	141-05-9	C8H12O4	2.0	50	10	200
Diethyl phthalate	84-66-2	C12H14O4	1.0	100	5	100
Diethyl sulphate	64-67-5	C4H10SO4	3.0	33	15	300
Diethyl sulphide	352-93-2	C4H10S	0.6	180	3	50
Diethylamine	109-89-7	C4H11N	1.0	100	5	100
Diethylaminoethanol, 2-	100-37-8	C6H15ON	2.7	40	15	270
Diethylaminopropylamine, 3-	104-78-9	C7H18N2	1.0	100	5	100
Difluoroethane, 1,1-	75-37-6	C2H4F2	ZR			
Difluoroethane, 1,2-	624-72-6	C2H4F2	ZR			
Difluoromethane	75-10-5	CH2F2	ZR			
Dihydrogen selenide	7783 07 5	H2Se	1.0	100	5	100
Dihydroxybenzene, 1,2	120-80-9	C6H6O2	1.0	100	5	100
Dihydroxybenzene, 1,3	108-46-3	C6H6O2	1.0	100	5	100
Diisobutylene	107-39-1	C8H16	0.6	156	3	60
Diisopropyl ether	108-20-3	C6H14O	0.7	150	3	70
Diisopropylamine	108-18-9	C6H15N	0.7	140	4	70
Diketene	674-82-8	C4H4O2	2.2	45	11	220

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Gas/ VOC	CAS No.	Formula	Relative response	Relative sensitivity (%)	Typical MDL Mini PID HI (ppb)	Typical MDL Mini PID LO (ppb)
Dimethoxymethane	109-87-5	C3H8O2	1.4	71	7	140
Dimethyl cyclohexane, 1,2-	583-57-3	C8H16	1.1	95	5	105
Dimethyl disulphide	624-92-0	C2H6S2	0.2	435	1	23
Dimethyl ether	115-10-6	C2H6O	1.3	80	7	130
Dimethyl phthalate	131-11-3	C10H10O4	1.0	100	5	100
Dimethyl sulphate	77-78-1	C2H6O4S	ZR			
Dimethyl sulphide	75-18-3	C2H6S	0.5	200	3	50
Dimethylacetamide N,N-	127-19-5	C4H9NO	1.3	75	7	130
Dimethylamine	124-40-3	C2H7N	1.4	70	7	140
Dimethylaminoethanol	108-01-0	C4H11NO	1.5	70	8	150
Dimethylaniline, NN-	121-69-7	C8H11N	0.6	167	3	60
Dimethylbutyl acetate	108-84-9	C8H16O2	1.6	60	8	160
Dimethylethylamine, NN-	598-56-1	C4H11N	0.8	125	4	80
Dimethylformamide	68-12-2	C3H7NO	0.9	110	5	90
Dimethylheptan-4-one, 2,6-	108-83-8	C9H18O	0.8	125	4	80
Dimethylhydrazine, 1,1-	57-14-7	C2H8N2	1.0	100	5	100
Dinitrobenzene, m-	99-65-0	C6H4N2O4	3.0	33	15	300
Dinitrobenzene, o-	528-29-0	C6H4N2O4	ZR			
Dinitrobenzene, p-	100-25-4	C6H4N2O4	5.0	20	25	500
Dinonyl phthalate	84-76-4	C26H42O4	1.0	100	5	100
Dioxane 1,2-		C4H8O2	1.5	67	8	150
Dioxane 1,4-	123-91-1	C4H8O2	1.5	67	8	150
Dipentene	138-86-3	C10H16	0.9	110	5	90
Diphenyl ether	101-84-8	C12H10O	0.8	125	4	80
Disulphur decafluoride	5714-22-7	S2F10	ZR			
Disulphur dichloride	10025-67-9	S2Cl2	3.0	33	15	300
Di-tert-butyl-p-cresol	2409-55-4	C11H16O	1.0	100	5	100
Divinylbenzene	1321-74-0	C10H10	0.4	250	2	40
Dodecanol	112-53-8	C12H26O	0.9	110	5	90
Enflurane	13838-16-9	C4H2F5ClO	ZR			
Epichlorohydrin	106-89-8	C3H5ClO	8.0	15	40	800
Epoxypropyl isopropyl ether, 2,3-	4016-14-2	C6H12O2	1.1	90	5	110
Ethane	74-84-0	C2H6	ZR			
Ethanol	64-17-5	C2H6O	8.7	10	45	870
Ethanolamine	141-43-5	C2H7NO	3.0	33	15	300
Ethoxy-2-propanol, 1-	1569-02-4	C5H10O2	2.0	50	10	200
Ethoxyethanol, 2-	110-80-5	C4H10O2	29.8	3	150	3000
Ethoxyethyl acetate, 2-	111-15-9	C6H12O3	3.0	33	15	300
Ethyl (S)-(-)-lactate	97-64-3	C5H10O3	3.0	33	15	300
Ethyl acetate	141-78-6	C4H8O2	3.6	28	20	360
Ethyl acrylate	140-88-5	C5H8O2	2.0	50	10	200
Ethyl amine	75-04-7	C2H7N	1.0	100	5	100
Ethyl benzene	100-41-4	C8H10	0.5	185	3	50
Ethyl butyrate	105-54-4	C6H12O2	1.0	105	5	100
Ethyl chloroformate	541-41-3	C3H5O2Cl	80	1	400	8300
Ethyl cyanoacrylate	7085-85-0	C6H7O2N	1.5	67	8	150
Ethyl decanoate	110-38-3	C12H24O2	1.8	56	10	180
Ethyl formate	109-94-4	C3H6O2	30	3	150	3000
Ethyl hexanoate	123-66-0	C8H16O2	2.6	38	15	260
Ethyl hexanol, 2-	105-76-7	C8H18O	1.5	67	8	150
Ethyl hexyl acrylate, 2-	103-11-7	C11H20O2	1.0	100	5	100
Ethyl mercaptan	75-08-1	C2H6S	0.7	145	3	70
Ethyl octanoate	106-32-1	C10H20O2	2.3	40	12	230

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Ethylene	74-85-1	C2H4	8.0	13	40	800
Ethylene dinitrate	628-96-6	C2H4O6N2	ZR			
Ethylene glycol	107-21-1	C2H6O2	20.0	5	100	2000
Ethylene oxide	75-21-8	C2H4O	15.0	7	75	1500
Ferrocene	102-54-5	C10H10Fe	0.8	125	4	80
Fluorine	7782-41-4	F2	ZR			
Fluoroethane	353-33-6	C2H5F	ZR			
Fluoromethane	593-53-3	CH3F	ZR			
Formaldehyde	50-00-0	CH2O	ZR			
Formamide	75-12-7	CH3ON	2.0	50	10	200
Formic acid	64-18-6	CH2O2	ZR			
Furfural	98-01-1	C5H4O2	1.4	70	7	140
Furfuryl alcohol	98-00-0	C5H6O2	2.0	50	10	200
Gasoline vapors	8006-61-9		1.1	95	5	105
Gasoline vapors	8006-61-9		0.8	125	4	80
Gasoline vapors 92 octane	8006-61-9		0.8	125	4	80
Germane	7782-65-2	GeH4	10.0	10	50	1000
Glutaraldehyde	111-30-8	C5H8O2	0.9	111	5	90
Halothane	151-67-7	CF3CHBrCl	ZR			
Helium		He	ZR			
Heptan-2-one	110-43-0	C7H14O	0.7	140	4	70
Heptan-3-one	106-35-4	C7H14O	0.8	133	4	75
Heptane n-	142-82-5	C7H16	2.1	50	10	200
Hexachloroethane	67-72-1	C2Cl6	ZR			
Hexafluoroethane	76-16-4	C2F6	ZR			
Hexamethyldisilazane, 1,1,1,3,3,3-.	999-97-3	C6H19NSi2	1.0	100	5	100
Hexamethyldisiloxane.	107-46-0	C6H18OSi2	0.3	350	1	30
Hexan-2-one	591-78-6	C6H12O	0.8	125	4	80
Hexane n-	110-54-3	C6H14	4.2	25	20	420
Hexene, 1-	592-41-6	C6H12	0.9	110	5	90
Hydrazine	302-01-2	H4N2	3.0	33	15	300
Hydrazoic acid	7782-79-8	HN3	ZR			
Hydrogen	1333-74-0	H2	ZR			
Hydrogen bromide	10035-10-6	HBr	ZR			
Hydrogen chloride	7647-01-0	HCl	ZR			
Hydrogen cyanide	74-90-8	HCN	ZR			
Hydrogen fluoride	7664-39-3	HF	ZR			
Hydrogen peroxide	7722-84-1	H2O2	4.0	25	20	400
Hydrogen sulfide	7783-06-4	H2S	4.0	25	20	400
Hydroquinone	123-31-9	C6H6O2	0.8	125	4	80
Hydroxypropyl acrylate 2-	999-61-1	C6H10O3	1.5	67	8	150
Iminodi(ethylamine) 2,2-	111-40-0	C4H13N3	0.9	110	5	90
Iminodiethanol 2,2'-	111-42-2	C4H11NO2	1.6	60	8	160
Indene	95-13-6	C9H8	0.5	220	2	50
Iodine	7553-56-2	I2	0.2	667	1	15
Iodoform	75-47-8	CHI3	1.5	67	8	150
Iodomethane	74-88-4	CH3I	0.4	250	2	40
Isoamyl acetate	123-92-2	C7H14O2	1.6	60	8	160
Isobutane	75-28-5	C4H10	8.0	15	40	800
Isobutanol	78-83-1	C4H10O	3.5	30	20	350
Isobutyl acetate	110-19-0	C6H12O2	2.3	45	10	230
Isobutyl acrylate	106-63-8	C7H12O2	1.3	80	7	130
Isobutylene	115-11-7	C4H8	1.0	100	5	100

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Gas/ VOC	CAS No.	Formula	Relative response	Relative sensitivity (%)	Typical MDL Mini PID HI (ppb)	Typical MDL Mini PID LO (ppb)
Isobutyraldehyde	78-84-2	C4H8O	1.2	80	6	120
Isocyanates, all			NV			
Isodecanol	25339-17-7	C10H22O	0.9	110	5	90
Isoflurane	26675-46-7	C3H2ClF5O	ZR			
Isononanol	2452-97-9	C9H20O	1.5	67	8	150
Isooctane	565-75-3	C8H18	1.1	90	5	100
Isooctanol	26952-21-6	C8H18O	1.7	60	9	170
Isopentane	78-78-4	C5H12	6.0	20	30	600
Isophorone	78-59-1	C9H14O	0.8	133	4	75
Isoprene	78-79-5	C5H8	0.7	140	3	70
Isopropanol	67-63-0	C3H8O	4.4	20	22	440
Isopropyl acetate	108-21-4	C5H10O2	2.2	50	10	220
Isopropyl chloroformate	108-23-6	C4H7O2Cl	1.6	60	8	160
Jet Fuel JP-4			0.8	133	4	75
Jet Fuel JP-5			0.7	150	3	60
Jet Fuel JP-8			0.7	150	3	60
Kerosene	8008-20-6		0.8	120	4	90
Ketene	463-51-4	C2H2O	3.0	33	15	300
Liquefied petroleum gas	68476-85-7		ZR			
Maleic anhydride	108-31-6	C4H2O3	2.0	50	10	200
Mercaptoacetic acid	68-11-1	C2H4O2S	1.0	100	5	100
Mercury	7439-97-6	Hg	NV			
Mercury alkyls			NV			
Mesitylene	108-67-8	C9H12	0.3	300	2	30
Methacrylic acid	79-41-4	C4H6O2	2.3	40	12	230
Methacrylonitrile	126-98-7	C4H5N	5.0	20	25	500
Methane	74-82-8	CH4	ZR			
Methanol	67-56-1	CH4O	200	1	1000	20000
Methoxyethanol, 2-	109-86-4	C3H8O2	2.7	40	15	270
Methoxyethoxyethanol, 2-	111-77-3	C5H12O3	1.4	70	7	140
Methoxymethylethoxy-2-propanol	34590-94-8	C7H16O3	1.3	80	7	130
Methoxypropan-2-ol	107-98-2	C4H10O2	3.0	33	15	300
Methoxypropyl acetate	108-65-6	C6H12O3	1.2	80	6	120
Methyl acetate	79-20-9	C3H6O2	5.2	20	25	500
Methyl acrylate	96-33-3	C4H6O2	3.4	30	17	340
Methyl bromide	74-83-9	CH3Br	1.9	50	10	190
Methyl cyanoacrylate	137-05-3	C5H5O2N	5.0	20	25	500
Methyl ethyl ketone	78-93-3	C4H8O	0.8	130	4	80
Methyl ethyl ketone peroxides	1338-23-4	C8H18O2	0.8	125	4	80
Methyl formate	107-31-3	C2H4O2	ZR			
Methyl isobutyl ketone	108-10-1	C6H12O	0.8	125	4	80
Methyl isocyanate	624-83-9	C2H3NO	ZR			
Methyl isothiocyanate	556-61-6	C2H3NS	0.6	167	3	60
Methyl mercaptan	74-93-1	CH4S	0.7	140	4	70
Methyl methacrylate	80-62-6	C5H8O2	1.6	60	8	160
Methyl propyl ketone	107-87-9	C5H10O	0.8	130	4	80
Methyl salicylate	119-36-8	C8H8O3	1.2	80	6	120
Methyl sulphide	75-18-3	C2H6S	0.5	200	3	50
Methyl t-butyl ether	1634-04-4	C5H12O	0.8	125	4	80
Methyl-2-propen-1-ol, 2-	51-42-8	C4H8O	1.1	90	5	100
Methyl-2-pyrrolidinone, N-	872-50-4	C5H9NO	0.9	110	5	90
Methyl-4,6-dinitrophenol, 2-	534-52-1	C7H6N2O5	3.0	33	15	300
Methyl-5-hepten-2-one, 6-	110-93-0	C8H14O	0.8	125	4	80

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Methylamine	74-89-5	CH5N	1.4	70	7	140
Methylbutan-1-ol, 3-	123-51-3	C5H12O	3.4	30	17	340
Methylcyclohexane	108-87-2	C7H14	1.1	90	6	110
Methylcyclohexanol, 4-	589-91-3	C7H14O	2.4	40	12	240
Methylcyclohexanone 2-	583-60-8	C7H12O	1.0	100	5	100
Methylheptan-3-one, 5-	541-85-5	C8H16O	0.8	133	4	75
Methylhexan-2-one, 5-	110-12-3	C7H14O	0.8	133	4	75
Methylhydrazine	60-34-4	CH6N2	1.3	80	7	130
Methyl-N-2,4, 6-tetranitroaniline, N-	479-45-8	C7H5N5O8	3.0	33	15	300
Methylpent-3-en-2-one, 4-	141-79-7	C6H10O	0.7	140	4	70
Methylpentan-2-ol, 4-	108-11-2	C6H14O	2.8	40	14	280
Methylpentane-2,4-diol, 2-	107-41-5	C6H14O2	4.0	25	20	400
Methylpropan-2-ol, 2-	75-65-0	C4H10O	3.5	30	18	350
Methylstyrene	25013-15-4	C9H10	0.5	200	3	50
Mineral oil	8042-47-5		0.8	125	4	80
Mineral spirits	64475-85-0		0.8	125	4	80
Naphthalene	91-20-3	C10H8	0.4	230	2	45
Nitric oxide	10102-43-9	NO	8.0	15	40	800
Nitroaniline 4-	100-01-6	C6H6N2O2	0.8	125	4	80
Nitrobenzene	98-95-3	C6H5NO2	1.7	60	10	170
Nitroethane	79-24-3	C2H5NO2	ZR			
Nitrogen dioxide	10102-44-0	NO2	10.0	10	50	1000
Nitrogen trichloride	10025-85-1	NCl3	1.0	100	5	100
Nitrogen trifluoride	7783-54-2	NF3	ZR			
Nitromethane	75-52-5	CH3NO2	ZR			
Nitropropane, 1-	108-03-2	C3H7NO2	ZR			
Nitropropane, 2-	79-46-9	C3H7NO2	ZR			
Nitrous oxide	10024-97-2	N2O	ZR			
Nonane, n-	111-84-2	C9H20	1.3	80	6	130
Norbornadiene, 2,5-	121-46-0	C7H8	0.6	167	3	60
Octachloronaphthalene	2234-13-1	C10Cl8	1.0	100	5	100
Octane, n-	111-65-9	C8H18	1.6	60	8	160
Octene, 1-	111-66-0	C8H16	0.7	140	3	70
Oxalic acid	144-62-7	C2H2O4	ZR			
Oxalonitrile	460-19-5	C2N2	ZR			
Oxydiethanol 2,2-	111-46-6	C4H10O3	4.0	25	20	400
Oxygen		O2	ZR			
Ozone	10028-15-6	O3	ZR			
Paraffin wax, fume	8002-74-2		1.0	100	5	100
Paraffins, normal	64771-72-8		1.0	105	5	100
Pentacarbonyl iron	13463-40-6	FeC5O5	1.0	100	5	100
Pentachloroethane	76-01-7	C2HCl5	ZR			
Pentachlorofluoroethane	354-56-3	C2Cl5F	ZR			
Pentafluoroethane	354-33-6	C2HF5	ZR			
Pentan-2-one	107-87-9	C5H10O	0.8	125	4	80
Pentan-3-one	96-22-0	C5H10O	0.8	125	4	80
Pentandione, 2,4-	123-54-6	C5H8O2	0.8	133	4	75
Pentane, n-	109-66-0	C5H12	7.9	15	40	800
Peracetic acid	79-21-0	C2H4O3	2.0	50	10	200
Perchloryl fluoride	7616-94-6	Cl03F	ZR			
Perfluoropropane	76-19-7	C3F8	ZR			
Petroleum ether			0.9	110	5	90
Phenol	108-95-2	C6H6O	1.2	85	6	120

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Phenyl propene, 2-	98-83-9	C9H10	0.4	230	2	45
Phenyl-2,3-epoxypropyl ether	122-60-1	C9H10O2	0.8	125	4	80
Phenylenediamine, p-	106-50-3	C6H8N2	0.6	167	3	60
Phosgene	75-44-5	COCl2	ZR			
Phosphine	7803-51-2	PH3	2.0	50	10	200
Picoline, 3-	108-99-6	C6H7N	0.9	110	5	90
Pinene, alpha	80-56-8	C10H16	0.3	315	2	30
Pinene, beta	127-91-3	C10H16	0.3	315	2	30
Piperidine	110-89-4	C5H11N	0.9	110	5	90
Piperylene	504-60-9	C5H8	0.7	150	3	67
Prop-2-yn-1-ol	107-19-7	C3H4O	1.3	80	7	130
Propan-1-ol	71-23-8	C3H8O	4.8	20	25	480
Propane	74-98-6	C3H8	ZR			
Propane-1,2-diol, total	57-55-6	C3H8O2	10.0	10	50	1000
Propene	115-07-1	C3H6	1.4	70	7	140
Propionaldehyde	123-38-6	C3H6O	1.7	60	8	169
Propionic acid	79-09-4	C3H6O2	8.0	15	40	800
Propyl acetate, n-	109-60-4	C5H10O2	2.5	40	13	250
Propylene dinitrate	6423-43-4	C3H6N2O6	ZR			
Propylene oxide	75-56-9	C3H6O	7.0	15	35	700
Propyleneimine	75-55-8	C3H7N	1.3	80	7	130
Pyridine	110-86-1	C5H5N	0.8	133	4	75
Pyridylamine 2-	504-29-0	C5H6N2	0.8	125	4	80
Silane	7803-62-5	SiH4	ZR			
Sodium fluoroacetate	62-74-8	C2H2O2FNa	ZR			
Styrene	100-42-5	C8H8	0.4	230	2	50
Sulphur dioxide	7446-09-5	SO2	ZR			
Sulphur hexafluoride	2551-62-4	SF6	ZR			
Sulphur tetrafluoride	7783-60-0	SF4	ZR			
Sulphuric acid	7664-93-9	H2SO4	ZR			
Sulphuryl fluoride	2699-79-8	SO2F2	ZR			
Terphenyls		C18H14	0.6	167	3	60
Terpinolene	586-62-9	C10H16	0.5	210	2	50
Tert-butanol	75-65-0	C4H10O	2.6	40	15	260
Tetrabromoethane, 1,1,2,2-	79-27-6	C2H2Br4	2.0	50	10	200
Tetracarbonylnickel	13463-39-3	NiC4O4	1.0	100	5	100
Tetrachloro-1,2-difluoroethane, 1,1,2,2-	76-12-0	C2Cl4F2	ZR			
Tetrachloro-1-fluoroethane, 1,1,2,2-	354-14-3	C2HCl4F	ZR			
Tetrachloro-2,2-difluoroethane, 1,1,1,2-	76-11-9	C2Cl4F2	ZR			
Tetrachloro-2-fluoroethane, 1,1,1,2-	354-11-0	C2HCl4F	ZR			
Tetrachloroethane, 1,1,1,2-	630-20-6	C2H2Cl4	ZR			
Tetrachloroethane, 1,1,2,2-	79-34-5	C2H2Cl4	ZR			
Tetrachloroethylene	127-18-4	C2Cl4	0.7	140	4	70
Tetrachloronaphthalenes, all isomers	20020-02-4	C10H4Cl4	1.0	100	5	100
Tetraethyl orthosilicate	78-10-4	C8H20O4Si	2.0	50	10	200
Tetraethyllead	78-00-2	C8H20Pb	ZR			
Tetrafluoroethane, 1,1,1,2-	811-97-2	C2H2F4	ZR			
Tetrafluoroethane, 1,1,2,2-	359-35-3	C2H2F4	ZR			
Tetrafluoroethylene	116-14-3	C2F4	1.0	100	5	100
Tetrafluoromethane	75-73-0	CF4	ZR			

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Tetrahydrofuran	109-99-9	C4H8O	1.6	65	8	150
Tetramethyl orthosilicate	681-84-5	C4H12O4Si	ZR			
Tetramethyl succinonitrile	3333-52-6	C8H12N2	1.0	100	5	100
Therminol			1.0	100	5	100
Thionyl chloride	7719-09-7	SOCl2	ZR			
Toluene	108-88-3	C7H8	0.5	200	3	50
Toluene-2,4-diisocyanate	584-84-9	C9H6N2O2	1.6	60	8	160
Toluenesulphonyl chloride, p-	98-59-9	C7H7SO2Cl	3.0	33	15	300
Toluidine, o-	95-53-4	C7H9N	0.5	200	3	50
Tributyl phosphate	126-73-8	C12H27O4P	5.0	20	25	500
Tributylamine	102-82-9	C12H27N	1.0	100	5	100
Trichloro-1,1-difluoroethane, 1,2,2-	354-21-2	C2HCl3F2	ZR			
Trichloro-1,2-difluoroethane, 1,1,2-	354-15-4	C2HCl3F2	ZR			
Trichloro-2,2-difluoroethane, 1,1,1-	354-12-1	C2HCl3F2	ZR			
Trichloro-2-fluoroethane, 1,1,2-	359-28-4	C2H2Cl3F	ZR			
Trichlorobenzene 1,2,4-	120-82-1	C6H3Cl3	0.6	180	3	50
Trichloroethane, 1,1,1-	71-55-6	C2H3Cl3	ZR			
Trichloroethane, 1,1,2-	79-00-5	C2H3Cl3	ZR			
Trichloroethylene	79-01-6	C2HCl3	0.7	150	3	65
Trichlorofluoromethane	75-69-4	CCl3F	ZR			
Trichloronitromethane	76-06-2	CCl3NO2	ZR			
Trichlorophenoxyacetic acid, 2,4,5-	93-76-5	C8H5O3Cl3	1.0	100	5	100
Trichloropropane 1,2,3-	96-18-4	C3H5Cl3	ZR			
Trichlorotrifluoroethane, 1,1,1-	354-58-5	C2Cl3F3	ZR			
Trichlorotrifluoroethane, 1,1,2-	76-13-1	C2Cl3F3	ZR			
Triethylamine	121-44-8	C6H15N	0.9	110	5	90
Trifluoroethane, 1,1,1-	420-46-2	C2H3F3	ZR			
Trifluoroethane, 1,1,2-	430-66-0	C2H3F3	ZR			
Trifluoroethanol, 2,2,2-	75-89-8	C2H3F3O	ZR			
Trifluoromethane	75-46-7	CHF3	ZR			
Trimethylamine	53-50-3	C3H9N	0.5	200	3	50
Trimethylbenzene mixtures		C9H12	0.3	300	2	35
Trimethylbenzene, 1,3,5-	108-67-8	C9H12	0.3	300	2	35
Trinitrotoluene 2,4,6-	118-96-7	C7H5N3O6	ZR			
Turpentine	8006-64-2	C10H16	0.6	167	3	60
TVOC			1.0	100	5	100
Undecane, n-	1120-21-4	C11H24	0.9	110	5	100
Vinyl acetate	108-05-2	C4H6O2	1.1	90	6	110
Vinyl bromide	593-60-2	C2H3Br	1.0	100	5	100
Vinyl chloride	75-01-4	C2H3Cl	2.1	50	10	200
Vinyl-2-pyrrolidinone, 1-	88-12-0	C6H9NO	0.9	110	5	90
Xylene mixed isomers	1330-20-7	C8H10	0.4	230	2	40
Xylene, m-	108-38-3	C8H10	0.4	230	2	50
Xylene, o-	95-47-6	C8H10	0.6	167	3	60
Xylene, p-	106-42-3	C8H10	0.6	180	3	50
Xylidine, all	1300-73-8	C8H11N	0.7	140	4	70

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