

PID RESPONSE FACTORS

In collaboration with ION Science



Photoionisation technology (PIDs) is the trusted solution to ensure workers are not being exposed to toxic levels of **Volatile Organic Compounds (VOCs)**. While LEL sensors are the most common sensors used to protect workers against explosive hazards, they alone are not sensitive enough to protect workers from low-level toxicity.

Occupational exposure limits are defined by safety regulations and it is important for businesses with personnel who work in close proximity to VOCs to monitor employee exposure within these limits.

Blackline's G7c personal gas monitor and G7 EXO area gas monitors feature a plug-and-play cartridge interface with diffusion and combination diffusion-pump options. Both cartridges are available with an industry-leading PID sensor from a world-class sensor vendor — ION Science. The world's largest manufacturer of PIDs, ION Science and has been proven to deliver the highest performance through third-party testing. Blackline selected the 10.6 eV ION Science MiniPID 2 sensor for use in G7 gas sensor cartridges, chosen for its robustness, low maintenance and long service life. The next generation long-life lamp provides exceptional stability and long-term performance, enabling reliable detection for 10,000 hours of use.

The ION Science MiniPID 2 is able to deliver dynamic and dependable response to thousands of volatile organic compounds (VOCs) in many different applications.

All MiniPID 2 sensors include patented Fence Electrode Technology for industry leading humidity resistant performance and anti-contamination design, protecting the sensor from moisture, dust and aerosols.



PID – CORRECT INTERPRETATION OF THE RESULTS

The safe use of PID requires knowledge of the environment in which it is used and correct interpretation of the results obtained.

For the PID sensor to respond to a volatile, the photon energy of the lamp must be greater than its ionisation energy (IE). The RF relates the sensitivity of PID to a volatile to the sensitivity to the standard calibration gas isobutylene. RFs are inverse to sensitivity, the higher RF, the lower the sensitivity.

Isobutylene is used to calibrate PID, and a Response Factor (RF) used to convert the isobutylene calibrated measurement to a measurement of the target volatile.



CONCENTRATION OF TARGET CHEMICAL = ISOBUTYLENE CALIBRATED MEASUREMENT X RF

Every chemical has a specific RF and this means that 100 ppm of one gas will give a different reading to 100 ppm of another gas. This is the reason why Response Factors must be used and the gas must be known to apply the right RF.

For example, the RF of anisole is 0.59 with a 10.6 eV lamp. That means 0.59 ppm anisole delivers the same PID response as 1 ppm isobutylene. A 100 ppm response to anisole, from an isobutylene-calibrated unit would indicate:

$$\text{Concentration of anisole} = 100 \text{ ppm} \times 0.59 = 59 \text{ ppm}$$

The RF of isopropanol is 4 with a 10.6 eV lamp. That means 4 ppm isopropanol delivers the same PID response as 1 ppm isobutylene. A 100 ppm response to isopropanol, from an isobutylene-calibrated unit would indicate:

$$\text{Concentration of isopropanol} = 100 \text{ ppm} \times 4 = 400 \text{ ppm}$$

VOC	RF	Isobutylene equivalent reading (ppm)	Real Compound concentration (ppm)
Anisole	0.59	100	59
Isopropanol	4.0	100	400

So the PID isobutylene calibrated will indicate the same reading BUT the two scenarios are completely different: in the first scenario we have a working environment with 59 ppm of anisole, in the second scenario we have 400 ppm of isopropanol.

VOC MIXTURES

Often mixtures are less well defined. The fraction of each chemical component in a vapour depends on relative rates of volatilisation, saturated vapour pressure, temperature and so on. For personnel safety monitoring, it is advisable to:

1. Convert TWA and STEL ppm levels of each component to an equivalent isobutylene concentration. We shall call this *ppm iBueq*:

$$TWA_{\text{ppm iBueq}} = TWA_{\text{ppm}}/RF, \quad STEL_{\text{ppm iBueq}} = STEL_{\text{ppm}}/RF$$

2. Adopt the lowest STEL_{ppm iBueq} and TWA_{ppm iBueq} for the PID detection of the vapour.

When the formulation of a given mixture is known, the overall response factor for the mixture can be calculated as follows:

$$RF = 1/[X1/RF1 + X2/RF2 + X3/RF3 \dots]$$

Where X1, X2, and X3 are the mole fractions of components 1, 2, and 3, etc. For example, if a mixture consisted of 20% anisole (RF = 0.59), 30% acetone (RF = 1.17) and 50% ethanol (RF = 11), the overall RF would be:

$$RF = 1/[(0.2/0.59) + (0.3/1.17) + (0.5/11)] = 1.56$$

This factor can then be used to reconstruct the concentration of each component. For example, to measure worker exposure near a vat generating the above volatile mixture, the PID is calibrated with isobutylene and the response factor is set to 1.56. If the overall reading is 100 ppm, then the concentration of anisole is 20 ppm, acetone is 30 ppm, and ethanol is 50 ppm.

In the Blackline Live Portal, users can call up many of these RFs. The display gives the concentration of the chemical directly and no extra calculations need to be done. Note that calling up an RF from the portal, does not make the PID more selective for that particular chemical – it still responds to all detectable chemicals present if there is a mixture.

If you're not able to find the RF in the portal, you can find it in the table here below and add it as a "Custom" RF.

- Chemicals are listed according to their most common name, but the CAS number should be used to more precisely identify each chemical.
- The RFs of many chemicals have been measured at ION Science typically with 10 and 50 ppm of the target volatile, using ten PIDs containing lamps of different photon energy and intensity and of different sensor designs. Generally, 50 ppm responses have been used. These RFs are indicated in bold in the table below
- Particular care should be taken in measuring the PID response of gases at concentrations exceeding a few 1000 ppm as non-linearity of PID response varies between chemicals.
- Caution should also be taken in making measurements at low concentrations of gas following exposure to concentrations which are 100's of times higher, due to the time required for sensor clear down.
- Certain groups of volatiles have been identified, or are suspected, of causing temporary contamination of the PID window.
- Given the diversity of volatiles detected by PID, the end user should frequently calibrate, or bump test the PID application in its initial application to the sensing of less common volatiles.
- In the table below, RF's listed as 'ZR' indicate zero response. 'NA' that the value is not available, because the PID response is insignificant at toxic concentrations of the volatile, or its RF is difficult to predict or measure.

PID RESPONSE FACTORS CHART



The **Notes** column in the table below identifies the following:

S: slow. PID requires at least 30 s for stable response.

V: Variable response. The response is susceptible to small changes in ambient conditions, particularly humidity.

X: Temporarily contaminating. PID responsivity may be suppressed for at least 30 min after 100 ppm-min exposure.

W!: Expected to cause PID lamp window fouling. May require regular bump tests and window cleaning.

ZR: Indicates zero response.

NA: The value is not available.

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Acetaldehyde	C2H4O	75-07-0	10.23	6	
Acetamide	C2H5NO	60-35-5	9.69	2	
Acetic acid	C2H4O2	64-19-7	10.66	28	
Acetic anhydride	C4H6O3	108-24-7	10.14	4	
Acetoin (3-hydroxybutanone)	C4H8O2	513-86-0	~9.8	1	
Acetone (2-propanone)	C3H6O	67-64-1	9.69	1.17	
Acetone cyanohydrin	C4H7NO	75-86-5	11.09	ZR	
Acetonitrile	CH3CN	75-05-8	12.20	ZR	
Acetophenone (methyl phenyl ketone)	C8H8O	98-86-2	9.29	0.6	
Acetyl bromide	C2H3BrO	506-96-7	10.24	8.0	
Acetylene	C2H2	74-86-2	11.40	ZR	
Acetylglycine, N-	C4H7NO3	543-24-8	9.40	2	
Acrolein	C3H4O	107-02-8	10.22	3.2	
Acrylic acid	C3H4O2	79-10-7	10.60	21	
Acrylonitrile	C3H3N	107-13-1	10.91	ZR	
Alkanes, n-, C6+	CnH2n+2	N/A	~10	1.2	
Allyl acetoacetate	C7H10O3	1118-84-9	~10	1.5	
Allyl alcohol	C3H6O	107-18-6	9.63	2.3	
Allyl bromide (3-bromopropene)	C3H5Br	106-95-6	9.96	3	
Allyl chloride (3-chloropropene)	C3H5Cl	107-05-1	10.05	4.5	
Allyl glycidyl ether	C6H10O2	106-92-3	~10	0.8	
Allyl propyl disulphide	C6H12S2	2179-59-1	~8.5	0.4	
Allylamine	C3H7N	107-11-9	8.80	0.8	SVX
Ammonia	NH3	7664-41-7	10.18	8.5	
Amyl acetate	C7H14O2	628-63-7	9.90	1.8	
Amyl alcohol	C5H12O	71-41-0	10.00	2.6	
Amyl alcohol, tert-	C5H12O	75-85-4	9.80	1.5	
Amyl salicylate	C12H16O3	2050-88-0	~9	4	
Anethole	C10H12O	104-46-1	~9	0.4	
Aniline	C6H7N	62-53-3	7.70	0.5	
Anisole	C7H8O	100-66-3	8.21	0.59	
Anisyl aldehyde	C8H8O2	123-11-5	~9	0.4	
Argon	Ar	7440-37-1	15.76	ZR	
Asphalt, petroleum fumes		8052-42-4	~9	1	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Benzaldehyde	C7H6O	100-52-7	9.49	0.7	
Benzene	C6H6	71-43-2	9.24	0.50	
Benzenethiol (thiophenol)	C7H7S	100-53-8	8.50	0.8	
Benzoic acid	C7H6O2	65-85-0	9.30	0.7	
Benzonitrile (cyanobenzene)	C7H5N	100-47-0	9.62	0.7	
Benzoquinone, o-	C6H4O2	583-63-1	9.30	1	
Benzoquinone, p-	C6H4O2	106-51-4	10.01	1	
Benzoyl bromide	C7H5BrO	618-32-6	9.65	2	
Benzyl 2-phenylacetate	C15H14O2	102-16-9	~9	0.5	
Benzyl acetate	C9H10O2	140-11-4	~9	0.6	
Benzyl alcohol	C7H8O	100-51-6	8.26	1.0	
Benzyl chloride	C7H7Cl	100-44-7	9.14	0.7	
Benzyl formate	C8H8O2	104-57-4	9.32	0.8	
Benzyl isobutyrate	C11H14O2	103-28-6	~9	0.5	
Benzyl nitrile	C8H7N	140-29-4	9.39	1	
Benzyl propionate	C10H12O2	122-63-4	~9	0.8	
Benzylamine	C7H9N	100-46-9	7.56	0.6	SVX
Biphenyl (diphenyl)	C12H10	92-52-4	8.23	0.4	
Borneol	C10H18O	507-70-0	~9	0.8	
Boron trifluoride	BF3	7637-07-02	15.50	ZR	
Bromine	Br2	7726-95-6	10.55	15	
Bromine pentafluoride	BrF5	7789-30-2	13.17	ZR	
Bromo-2,2-dimethylpropane, 1- (neopentyl bromide)	C5H11Br	630-17-1	10.04	2	
Bromo-2-chloroethane, 1-	C2H4BrCl	107-04-0	10.57	3	
Bromo-2-methylpentane, 1-	C6H13Br	25346-33-2	10.09	2	
Bromoacetone	C3H5BrO	598-31-2	9.73	1.0	
Bromoacetylene	C2HBr	593-61-3	10.31	4	
Bromobenzene	C6H5Br	108-86-1	8.98	0.32	
Bromobutane, 1-	C4H9Br	109-65-9	10.13	1.6	
Bromobutane, 2-	C4H9Br	78-76-2	10.01	0.97	
Bromochloromethane	CH2ClBr	74-97-5	10.77	ZR	
Bromocyclohexane	C6H11Br	108-85-0	9.87	2	
Bromoethane	C2H5Br	74-96-4	10.29	1.6	
Bromoethyl methyl ether, 2-	C2H5BrO	540-51-2	10.00	2	
Bromofluoromethane	C3H7OBr	6482-24-2	10.00	2.5	
Bromoform (tribromomethane)	CH2FBr	373-52-4	~11	ZR	
Bromopentane, 1- (n-pentyl bromide)	CHBr3	75-25-2	10.48	2.8	
Bromopropane, 1- (n-propyl bromide)	C5H11Br	110-53-2	10.10	1.1	
Bromopyridine, 3-	C3H7Br	106-94-5	10.18	1.5	
Bromopyridine, 4-	C5H4BrN	626-55-1	9.75	2	
Bromotrifluoromethane	C5H4BrN	1120-87-2	9.94	2	
Bromotrimethylsilane	CF3Br	75-63-8	11.78	ZR	
But-2-ynal	C3H9BrSi	2857-97-8	10.00	1.9	
But-3-ynal	C4H4O	1119-19-3	10.20	3	
Butadiene diepoxide, 1,3-	C4H4O	52844-23-2	9.85	1.5	
Butadiene, 1,3-	C4H6O2	1464-53-5	10.00	4	
Butane, n-	C4H6	106-99-0	9.07	0.8	
Butanediol, 2,3-	C4H10	106-97-8	10.63	40	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Butanedione, 2,3- (biacetyl, diacetyl)	C4H6O2	431-03-8	9.56	0.86	
Butanoic acid	C4H8O2	107-92-6	10.17	5	
Butanol, 1-	C4H10O	71-36-3	10.04	3.9	
Butanol, 2-	C4H10O	78-92-2	10.10	3.0	
Buten-3-ol, 1-	C4H8O	598-32-3	9.50	1.8	
Butene nitrile, 3-	C4H5N	109-75-1	10.20	3.0	
Butene, 1-	C4H8	106-98-9	9.58	1.5	
Butene, 2-	C4H8	107-01-7	9.10	1.3	
Butene, cis-2-	C4H8	590-18-1	9.13	1.3	
Butene, trans-2-	C4H8	624-64-6	9.13	1.3	
Butenoic acid, 3-	C4H6O2	107-93-7	9.75	2	
Butoxyethanol, 2- (Butyl Cellosolve®)	C6H14O2	111-76-2	8.68	1.1	
Butoxyethoxyethanol (ethylene glycol monobutyl ether acetate)	C8H18O3	112-34-5	~10	3	
Butoxyethylacetate, 2-	C8H16O3	112-07-2	~9.8	2	
Butyl acetate	C6H12O2	123-86-4	9.91	2.5	
Butyl acetate, sec-	C6H12O2	105-46-4	9.91	1.8	
Butyl acrylate	C7H12O2	141-32-2	~9.6	1.5	
Butyl butyrate	C8H16O2	109-21-7	~9.7	1.8	
Butyl chloroformate	C5H9ClO2	592-34-7	~10.4	3.2	
Butyl cyclohexan-1-ol, 4- tert- (4-t-butylcyclohexanol)	C10H20O	98-52-2	~8.8	1.4	
Butyl cyclohexyl acetate, 2- tert- (2-t-butylcyclohexylacetate)	C12H22O2	88-41-5	~10	0.9	
Butyl diglycol acetate	C10H20O4	124-17-4	~10	3.0	
Butyl ether, n- (dibutyl ether)	C8H18O	142-96-1	9.28	0.82	
Butyl glycidyl ether	C7H14O2	2426-08-06	~10	2	
Butyl iodide (iodobutane)	C4H9I	542-69-8	9.23	1	
Butyl isocyanate	C5H9NO	111-36-4	10.14	2.5	
Butyl lactate	C7H14O3	138-22-7	9.80	2.5	
Butyl mercaptan, n- (n-butyl mercaptan)	C4H10S	109-79-5	9.15	0.8	
Butyl mercaptan, tert-	C4H10S	75-66-1	9.03	0.62	
Butyl methacrylate	C8H14O2	97-88-1	~9.5	1	
Butyl propionate, n-	C7H14O2	590-01-2	~9.7	1.9	
Butylamine, n-	C4H11N	109-73-9	8.71	1	S X
Butylamine, sec-	C4H11N	513-49-5	8.70	0.9	S X
Butylamine, tert-	C4H11N	75-64-9	8.64	1.2	S X
Butylbenzene	C10H14	104-51-8	8.69	0.5	
Butylbenzene, sec-	C10H14	135-98-8	8.68	0.4	
Butylbenzene, tert-	C10H14	98-06-6	8.69	0.4	
Butylene carbonate, 1,2- (4-ethyl-1,3-dioxolan-2-one)	C5H8O3	4437-85-8	~10.4	18	
Butylphenol, o-sec-	C10H14O	89-72-5	7.80	0.9	
Butyn-1-ol, 2-	C4H6O	764-01-2	9.78	1.5	
Butyn-2-one	C4H4O	1423-60-5	10.17	3	
Butyraldehyde	C4H8O	123-72-8	9.86	1.7	
Butyrolactone, gamma-	C4H6O2	96-48-0	10.26	15	
Butyronitrile	C4H7N	109-74-0	11.67	NR	
Butyryl chloride	C4H7ClO	141-75-3	~10.4	3	
Camphene	C10H16	565-00-4	8.86	0.5	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Camphor	C10H16O	76-22-2	8.76	0.4	
Carbon dioxide	CO2	124-38-9	13.77	ZR	
Carbon disulphide	CS2	75-15-0	10.08	1.4	
Carbon monoxide	CO	630-08-0	14.01	ZR	
Carbon suboxide	C3O2	504-64-3	10.60	10	
Carbon tetrabromide	CBr4	558-13-4	10.31	3	
Carbon tetrachloride	CCl4	56-23-5	11.47	ZR	
Carbonyl fluoride	COF2	353-50-4	13.02	NR	
Carbonyl sulphide	COS	463-58-1	11.18	ZR	
Carene	C10H16	13466-78-9	8.40	0.5	
Carvacrol	C10H14O	499-75-2	~9	0.8	
Carvone, R-	C10H14O	6485-40-1	9.77	1.6	
Caryophyllene	C15H24	13877-93-5	~9	0.4	
Chloramine (monochloramine)	ClH2N	10599-90-3	9.85	2	
Chlorine	Cl2	7782-50-5	11.48	ZR	
Chlorine dioxide	ClO2	10049-04-4	10.36	ZR	
Chlorine trifluoride	ClF3	7790-91-2	12.65	ZR	
Chloro-1,1,1,2-tetrafluoroethane, 2- (R-124)	C2HClF4	2837-89-0	~12	ZR	
Chloro-1,1,1-trifluoroethane, 2- (R-133a)	C2H2ClF3	75-88-7	~12	ZR	
Chloro-1,1,2,2-tetrafluoroethane, 1- (R-124a)	C2HClF4	354-25-6	~12	ZR	
Chloro-1,1,2-trifluoroethane, 1- (R-133)	C2H2ClF3	421-04-5	~12	ZR	
Chloro-1,1-difluoroethane, 1- (R-142b)	C2H3ClF2	75-68-3	11.98	ZR	
Chloro-1,1-difluoroethane, 2- (R-142)	C2H3ClF2	338-65-8	~11.9	ZR	
Chloro-1,1-difluoroethene, 2- (R-1122)	C2HClF2	359-10-4	9.80	1.5	
Chloro-1,2,2-trifluoroethane, 1-	C2H2ClF3	431-07-2	~12	ZR	
Chloro-1-fluoroethane, 1- (R-151a)	C2H4ClF	1615-75-4	~11.7	ZR	
Chloro-2-fluoroethane, 1- (R-151)	C2H4ClF	762-50-5	~11.7	ZR	
Chloro-2-propanone, 1-	C3H5ClO	78-95-5	9.92	1	
Chloroacetaldehyde (2-chloroethanal)	C2H3OCl	107-20-0	10.16	3	
Chloroacetyl chloride	C2H2Cl2O	79-04-9	10.30	8.0	V
Chlorobenzene	C6H5Cl	108-90-7	9.07	0.45	
Chlorobutane, 1- (butyl chloride)	C4H9Cl	109-69-3	10.64	10	
Chlorobutane, 2-	C4H9Cl	78-86-4	10.57	5.8	
Chlorocyclohexane	C6H11Cl	542-18-7	10.10	2	
Chlorodifluoromethane	CHClF2	75-45-6	12.45	ZR	
Chloroethane	C2H5Cl	75-00-3	10.97	ZR	
Chloroethanol, 2- (ethyl chlorohydrin)	C2H5ClO	107-07-3	10.50	10	
Chloroethyl methyl ether, 2-	C3H7ClO	627-42-9	10.25	2.6	
Chlorofluoromethane	CH2ClF	593-70-4	11.71	ZR	
Chloroform	CHCl3	67-66-3	11.42	ZR	
Chloromethane	CH3Cl	74-87-3	11.28	ZR	
Chloromethoxyethane (chloromethyl ethyl ether)	C3H7ClO	3188-13-4	10.30	4	
Chloropentafluoroethane	C2ClF5	76-15-3	12.96	ZR	
Chloroprene (2-chlorobuta-1,3-diene)	C4H5Cl	126-99-8	8.79	1.3	
Chloropyridine, 2-	C5H4ClN	109-09-1	9.00	1	
Chlorostyrene, o-	C8H7Cl	2039-87-4	~8.5	0.4	
Chlorothiophene, 3-	C4H3ClS	17249-80-8	8.92	0.7	
Chlorotoluene, m-	C7H7Cl	108-41-8	8.70	0.5	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Chlorotoluene, o-	C7H7Cl	95-49-8	8.83	0.5	
Chlorotoluene, p-	C7H7Cl	106-43-4	8.69	0.4	
Chlorotrifluoroethylene (R-1113)	C2ClF3	79-38-9	9.81	1	
Chlorotrifluoromethane	CClF3	75-72-9	12.60	ZR	
Cinnamic aldehyde	C8H8O	104-55-2	~9	0.4	
Cinnamyl acetate	C11H12O2	21040-45-9	~9	0.4	
Cinnamyl alcohol	C9H10O	104-54-1	8.10	0.4	
Citral	C10H16O	5392-40-5	~8.7	1.7	
Citronellal	C10H18O	106-23-0	~9	0.9	
Citronellol	C10H20O	26489-01-0	~8.5	1.0	
Citronellol acetate	C12H22O2	150-84-5	~9	1.5	
Citronellol formate	C11H20O2	105-85-1	~9	1.5	
Citronellyl isobutyrate	C14H26O2	97-89-2	~9	0.9	
Clary propyl acetate	C11H20O3	131766-73-9	~9	1.2	
Coumarin	C9H6O2	91-64-5	~9	0.4	
Creosote	n/a	8021-39-4	~9	1	
Cresol, m- (3-methylphenol)	C7H8O	108-39-4	8.36	2.2	
Cresol, o- (2-methylphenol)	C7H8O	95-48-7	8.14	1.1	
Cresol, p- (4-methylphenol)	C7H8O	106-44-5	8.31	1.1	
Cresyl acetate, p-	C9H10O2	140-39-6	8.60	1.0	
Cresyl ethyl ether, p-	C9H12O	622-60-6	~9	0.8	
Cresyl methyl ether	C8H10O	104-93-8	~9	0.8	
Crotonaldehyde	C4H6O	4170-30-3	9.73	1.9	
Crotonyl alcohol	C4H8O	6117-91-5	9.13	0.8	
Cyanogen bromide	CNBr	506-68-3	11.84	ZR	
Cyanogen chloride	CNCl	506-77-4	12.49	ZR	
Cycloalkanes	N/A	N/A	~10	1.5	
Cyclobutanone	C4H6O	1191-95-3	9.35	1.2	
Cyclobutene	C4H6	822-35-5	9.43	3	
Cycloheptane	C7H14	291-64-5	9.82	1.1	
Cyclohex-2-enedione, 1,4-	C6H6O2	4505-38-8	9.77	1.0	
Cyclohexane	C6H12	110-82-7	9.98	1.3	
Cyclohexanethiol	C6H12S	1569-69-3	~9	0.5	
Cyclohexanol	C6H12O	108-93-0	10.00	1.6	
Cyclohexanone	C6H10O	108-94-1	9.16	1.0	
Cyclohexene	C6H10	110-83-8	8.95	0.9	
Cyclohexyl acetate	C8H14O2	622-45-7	~9.5	1.2	
Cyclohexylamine	C6H13N	108-91-8	8.37	3	S X
Cyclooctadiene	C8H12	29965-97-7	~9.5	1.0	
Cyclopentadiene	C5H6	542-92-7	8.56	0.8	
Cyclopentane	C5H10	287-92-3	10.52	10	X
Cyclopentanone	C5H8O	120-92-3	9.26	0.9	
Cyclopentene	C5H8	142-29-0	9.01	1.5	
Cyclopentene-1,3-dione, 4-	C5H4O2	930-60-9	9.60	1.0	
Cyclopropylamine	C3H7N	765-30-0	8.80	1.5	SV X
Cymene, p-	C10H14	99-87-6	8.29	0.4	
Decahydronaphthalene (4-isopropyltoluene)	C10H18	91-17-8	9.14	0.9	
Decanal (decalin)	C10H20O	112-31-2	~9	1.2	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Decane	C10H22	124-18-5	9.65	1.2	
Decenal, trans-4-	C10H18O	65405-70-01	~9	1.4	
Decene	C10H22	872-05-9	~9.5	0.8	
Decyne, 1-	C10H18	764-93-2	9.91	0.43	
Desfluorane (2-(difluoromethoxy)-1,1,1,2-tetrafluoroethane)	C3H2F6O	57041-67-5	~11	ZR	
Deuterium oxide	D2O	7789-20-0	13.60	ZR	
Diacetone alcohol (4-hydroxy-4-methyl-pentan-2-one)	C6H12O2	123-42-2	~9.6	0.9	
Diazine, 1,2- (1,2-diazabenzene)	C4H4N2	289-80-5	9.65	3	
Diazine, 1,3- (1,3-diazabenzene)	C4H4N2	289-95-2	9.33	3	
Diborane	B2H6	19287-45-7	11.38	ZR	
Dibromoacetylene	C2Br2	624-61-3	9.65	2	
Dibromochloromethane	CHBr2Cl	124-48-1	10.59	10	
Dibromocyclohexane, 1,2-	C6H10Br2	5401-62-7	10.02	3	
Dibromocyclopentane	C5H8Br2	33547-17-0	10.06	3	
Dibromodichloromethane	CBr2Cl2	594-18-3	10.40	4	
Dibromodifluoromethane	CF2Br2	75-61-6	11.07	3	
Dibromoethane, 1,2- (EDB, ethylene dibromide)	C2H4Br2	106-93-4	10.35	2	
Dibromoethene, 1,1- (vinylidene bromide)	C2H2Br2	593-92-0	9.78	1.5	
Dibromoethene, 1,2-	C2H2Br2	540-49-8	9.63	1.5	
Dibromomethane (methylene dibromide)	CH2Br2	74-95-3	10.41	1.9	
Dibromotetrafluoroethane, 1,2-	C2F4Br2	124-73-2	11.10	ZR	
Dichloro-1,1,1-trifluoroethane, 2,2- (R-124)	C2HCl2F3	306-83-2	11.50	ZR	
Dichloro-1,1-difluoroethane, 1,2- (R-132a)	C2H2Cl2F2	1649-08-7	~11.5	ZR	
Dichloro-1,2,2-trifluoroethane, 1,2-	C2HCl2F3	354-23-4	~11.5	ZR	
Dichloro-1,2-difluoroethane, 1,2- (R-132)	C2H2Cl2F2	431-06-1	~11.5	ZR	
Dichloro-1,2-difluoroethene, (1,2- 1,2-dichlorodifluoroethene)	C2Cl2F2	598-88-9	10.20	2	
Dichloro-1,3-butadiene, 1,4-	C4H6Cl2	1587-29-7	~9	0.6	
Dichloro-1-fluoroethane, 1,1- (R-141a)	C2H3Cl2F	1717-00-6	~11	ZR	
Dichloro-1-fluoroethane, 1,2- (R-141)	C2H3Cl2F	430-57-9	~11	ZR	
Dichloro-1-propene, 2,3-	C3H4Cl2	78-88-6	~10.5	1.4	
Dichloro-2,2,-difluoroethene, 1,1- (R-1112a)	C2Cl2F2	79-35-6	9.69	1	
Dichloro-2-butene, 1,4-	C4H7Cl	764-41-0	~9.5	2.0	
Dichloro-2-butene, trans-1,4-	C4H7Cl	110-57-6	~9.5	2.0	
Dichloroacetylene	C2Cl2	7572-29-4	9.90	5	
Dichlorobenzene, m-	C6H4Cl2	541-73-1	0.00	0.5	
Dichlorobenzene, o-	C6H4Cl2	95-50-1	9.06	0.6	
Dichlorobenzene, p-	C6H4Cl2	106-46-7	9.06	0.5	
Dichlorodifluoromethane	CCl2F2	75-71-8	11.75	ZR	
Dichloroethane, 1,1- (1,1-DCA)	C2H4Cl2	75-34-3	11.06	ZR	
Dichloroethane, 1,2- (EDC or 1,2-DCA)	C2H4Cl2	107-06-2	11.05	ZR	
Dichloroethene, 1,1- (1,1-dichloroethene)	C2H2Cl2	75-35-4	10.00	1.0	
Dichloroethene, 1,2- (1,1-DCE, vinylidene chloride)	C2H2Cl2	540-59-0	9.65	0.4	
Dichloroethene, cis-1,2- (c-1,2-DCE)	C2H2Cl2	156-59-2	9.66	0.8	
Dichloroethene, trans-1,2- (t-1,2-DCE)	C2H2Cl2	156-60-5	9.65	0.4	
Dichlorofluoromethane	CHFCl2	75-43-4	12.39	ZR	
Dichloromethane (methylene chloride)	CH2Cl2	75-09-2	11.32	70	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Dichloromethylamine	CH3Cl2N	7651-91-4	9.52	2	S X
Dichloropropane, 1,2-	C3H6Cl2	78-87-5	10.87	ZR	
Dichlorotetrafluoroethane, 1,1-	C2Cl2F4	374-07-2	12.20	ZR	
Dichlorotetrafluoroethane, 1,2-	C2Cl2F4	76-14-2	12.20	ZR	
Dicyclohexylamine	C12H23N	101-83-7	~8.5	0.9	S X
Dicyclopentadiene	C10H12	77-73-6	7.74	0.65	
Diesel fuel		68334-30-5	8.00	0.8	
Diethoxyethane, 1,1-	C6H14O2	105-57-7	9.78	1.5	V
Diethyl carbonate	C5H10O3	105-58-8	~10.3	7	
Diethyl ether (ethyl ether)	C4H10O	60-29-7	9.53	1.1	
Diethyl maleate	C8H12O4	141-05-9	~10	2	
Diethyl malonate	C7H12O4	105-53-3	10.20	4	
Diethyl phosphite	C4H11O3P	762-04-9	10.31	2	
Diethyl phthalate	C12H14O4	84-66-2	~9	1	
Diethyl sulfate	C4H10SO4	64-67-5	~10.5	3	
Diethyl sulphide	C4H10S	352-93-2	8.43	0.6	
Diethyl sulfone	C4H10O2S	597-35-3	9.96	2.0	
Diethylacetylene	C6H10	928-49-4	10.03	2	
Diethylamine	C4H11N	109-89-7	8.01	1.4	S X
Diethylaminoethanol, 2-	C6H15ON	100-37-8	8.58	2.7	S X
Diethylaminopropylamine, 3-	C7H18N2	104-78-9	~9	5	S X
Diethylene glycol monoethyl ether	C6H14O3	111-90-0	~9	0.6	
Diethylenetriamine	C4H13N3	111-40-0	~9	1	S X
Diethylhydroxylamine	C4H11NO	3710-84-7	~10	1.5	X
Diethylsilane	C4H12Si	542-91-6	9.80	2	
Difluoroethane, 1,1-	C2H4F2	75-37-6	11.87	ZR	
Difluoroethane, 1,2-	C2H4F2	624-72-6	11.86	ZR	
Difluoromethane	CH2F2	75-10-5	12.71	ZR	
Diglycidyl ether (glycidic ether)	C6H10O3	2238-07-5	~9.6	3	
Dihydroeugenol	C10H14O2	2785-87-7	~9	0.4	
Dihydrojasmon	C11H18O	1128-08-1	~9	0.6	
Dihydromyrcenol	C10H20O	18479-58-8	~9	0.8	
Dihydroxybenzene, 1,2- (catechol, benzene-1,2-diol)	C6H6O2	120-80-9	8.56	1	
Dihydroxybenzene, 1,3- (resorcinol)	C6H6O2	108-46-3	8.63	1	
Diiodomethane (methylene iodide)	CH2I2	75-11-6	9.46	1.2	
Diisobutyl ketone (isovalerone)	C9H18O	108-83-8	9.04	0.8	
Diisobutylene (2,4,4-trimethylpentene-1 or 2,4,4-trimethylpentene-2)	C8H16	107-39-1	8.91	0.7	
Diisopropyl ether (isopropyl ether)	C6H14O	108-20-3	9.20	0.70	
Diisopropylamine	C6H15N	108-18-9	7.73	0.7	S X
Diisopropylbenzene	C12H18	25321-09-9	~8.8	0.5	
Diketene	C4H4O2	674-82-8	9.60	2.2	
Dimethoxybenzene, 1,4-	C8H10O2	150-78-7	~9	1.3	
Dimethoxyethane, 1,2- (ethylene glycol dimethyl ether)	C4H10O2	110-71-4	9.20	0.9	
Dimethoxymethane (formal)	C3H8O2	109-87-5	10.00	2.8	
Dimethyl carbonate	C3H6O3	616-38-6	10.52	60	
Dimethyl disulphide (DMDS)	C2H6S2	624-92-0	8.46	0.2	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Dimethyl ether (methyl ether)	C2H6O	115-10-6	10.03	1.3	
Dimethyl phosphite	C2H7O3P	868-85-9	10.53	8	
Dimethyl phthalate	C10H10O4	131-11-3	9.64	1	
Dimethyl sulfate	C2H6O4S	77-78-1	~12	ZR	
Dimethyl sulfoxide	C2H6OS	67-68-5	9.10	20	V
Dimethylacetamide N,N- (DMSO)	C4H9NO	127-19-5	8.81	1.3	
Dimethylacetylene	C4H6	503-17-3	9.58	1	
Dimethylamine	C2H7N	124-40-3	8.24	1.5	S X
Dimethylaminoethanol, 2- (dimethylethanolamine)	C4H11NO	108-01-0	8.80	1.5	SV X
Dimethylaniline, NN-	C8H11N	121-69-7	7.12	0.6	
Dimethylboron bromide	C2H6BBr	5158-50-9	10.25	4	
Dimethylbutyl acetate, 1,3- (sec-hexyl acetate)	C8H16O2	108-84-9	~9.5	1.6	
Dimethylcycloheptane, 1,2-	C9H18	13151-50-3	10.21	1.3	
Dimethylcyclohexane,1,2- (1,2-DMCH)	C8H16	583-57-3	9.41	0.55	
Dimethylcyclopentane	C7H14	1192-18-3	9.92	1.2	
Dimethylethylamine, NN- (DMEA)	C4H11N	598-56-1	7.74	1.6	S X W!
Dimethylformamide (DMF)	C3H7NO	68-12-2	9.13	1.3	
Dimethylhydrazine, 1,1- (UDMH)	C2H8N2	57-14-7	8.05	1	
Dimethylmethylphosphonate (DMMP)	C3H9O3P	756-79-6	9.94	5	
Dimethyloctan-1-ol, 3,7-	C10H22O	106-21-8	~9	1.2	
Dimethyloctan-3-ol, 3,7-	C10H22O	78-69-3	~9	1.2	
Dimethylpentane, 2,4-	C7H16	108-08-7	~9.8	1	
Dimethylsilane	C2H8Si	1111-74-6	10.30	2	
Dimethylthiophosphoryl chloride	C2H6ClO2PS	2524-03-0	~9	1	
Di-n-butylamine	C8H19N	111-92-2	7.69	6	S X
Di-n-propylamine	C6H15N	142-84-7	7.80	1.5	SV X
Dioxane, 1,4- (p-dioxane)	C4H8O2	123-91-1	9.13	1.45	
Dioxolane	C3H6O2	646-06-0	9.13	2.7	
Dipentene (limonene)	C10H16	138-86-3	~8.6	0.9	
Dipentene, (+)- (limonene)	C10H16	5989-27-5	0.00	0.8	
Diphenyl ether (phenyl ether)	C12H10O	101-84-8	8.09	1.5	
Dipropyl ether (propyl ether)	C6H14O	111-43-3	9.30	1.0	
Dipropylene glycol	C6H14O3	110-98-5	~10	4	
Disilane	Si2H6	1590-87-0	9.74	2	
Disulphur decafluoride	S2F10	5714-22-7	12.77	ZR	
Disulphur dibromide	S2Br2	13172-31-1	9.23	1.5	
Disulphur dichloride	S2Cl2	10025-67-9	9.40	3	
Di-tert-butyl-p-cresol	C15H24O	128-37-0	7.80	0.3	
Divinylbenzene	C10H10	1321-74-0	~8.2	0.7	X
Divinylbenzene, 1,3-	C10H10	108-57-6	~8.3	0.6	
Dodecene	C12H24	112-40-3	~8.8	1.0	
Enflurane	C4H2F5ClO	13838-16-9	11.70	ZR	
Epichlorohydrin (1-chloro-2,3-epoxypropane)	C3H5ClO	106-89-8	10.20	5	
Epoxypropyl isopropyl ether, 2,3- (glycidyl isopropyl ether)	C6H12O2	4016-14-2	~10	1.2	
Estagole	C10H12O	140-67-0	~9	0.7	
Ethane	C2H6	74-84-0	11.56	ZR	
Ethanol (alcohol, ethyl alcohol)	C2H6O	64-17-5	10.43	11	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)		Notes
				10.6 eV		
Ethanolamine	C2H7NO	141-43-5	10.47	3		X
Ethoxy-2-methylpropane, 1-	C6H14O	627-02-1	9.30	1		
Ethoxy-2-propanol, 1- (propylene glycol ethyl ether)	C5H12O2	1569-02-4	~9.6	2.4		
Ethoxybutane, 2-	C6H14O	19316-73-5	9.32	1		
Ethoxyethanol, 2- (Ethyl Cellosolve®, EGME)	C4H10O2	110-80-5	9.60	2		
Ethoxyethyl acetate, 2-	C6H12O3	111-15-9	~10	3		
Ethyl 2,2,2-trifluoroethyl ether (TFEE)	C4H7F3O	461-24-5	10.27	5		
Ethyl 2-methylbutyrate	C7H14O2	7452-79-1	~9	1.4		
Ethyl acetate	C4H8O2	141-78-6	10.01	4.5		
Ethyl acetoacetate	C6H10O3	141-97-9	~9.5	2.5		
Ethyl acrylate	C5H8O2	140-88-5	10.30	2.3		
Ethyl benzoate	C9H10O2	93-89-0	8.90	0.9		
Ethyl butyrate	C6H12O2	105-54-4	~9.9	1.4		
Ethyl chloroformate	C3H5O2Cl	541-41-3	10.64	80		
Ethyl cyanoacrylate	C6H7O2N	7085-85-0	~10	1.5		
Ethyl decanoate	C12H24O2	110-38-3	~9.6	1.8		
Ethyl formate	C3H6O2	109-94-4	10.61	35		
Ethyl hexanoate	C8H16O2	123-66-0	~9.75	1.6		
Ethyl hexanol, 2-	C8H18O	104-76-7	~9.8	1.5		
Ethyl hexyl acrylate, 2-	C11H20O2	103-11-7	~9	1		
Ethyl iodide (iodoethane)	C2H5I	75-03-6	9.34	0.30		
Ethyl isopropyl ketone (2-methylpentan-3-one)	C6H12O	565-69-5	9.10	0.8		
Ethyl lactate	C5H10O3	97-64-3	~10	2.1		
Ethyl mercaptan (thioethanol)	C2H6S	75-08-1	9.29	0.6		
Ethyl methacrylate	C6H10O2	97-63-2	~9.5	1.06		
Ethyl methyl carbonate	C4H8O3	623-53-0	10.40	18		
Ethyl octanoate	C10H20O2	106-32-1	~9.7	2.3		
Ethyl perfluorobutyl ether	C6H5F9O	163702-05-4	~11	NR		
Ethyl phenyl acetate	C10H12O2	101-97-3	~9	1.2		
Ethyl propanoate	C5H10O2	105-37-3	10.01	2.5		
Ethyl tert-butyl ether	C6H14O	637-92-3	9.39	0.8		
Ethyl-2-methyl benzene, 1- (2-ethyltoluene)	C9H12	611-14-3	~8.7	0.5		
Ethyl-3-ethoxypropionate	C7H14O3	763-69-9	~9.5	3		
Ethylacetylene	C4H6	107-00-6	10.18	3		
Ethylamine	C2H7N	75-04-7	8.86	1		S X
Ethylbenzene	C8H10	100-41-4	8.76	0.56		
Ethylcyclohexane	C8H16	1678-91-7	9.54	0.8		
Ethylene (ethene)	C2H4	74-85-1	10.51	50		
Ethylene carbonate	C3H4O3	96-49-1	10.40	ZR		
Ethylene cyanohydrin	C3H5NO	109-78-4	~10.8	ZR		
Ethylene dinitrate	C2H4O6N2	628-96-6	~10.8	ZR		
Ethylene glycol	C2H6O2	107-21-1	10.16	9		
Ethylene glycol diacetate	C6H10O4	111-55-7	~10	4		
Ethylene glycol monopropyl ether (2-propoxyethanol)	C5H12O2	2807-30-9	~9	3		
Ethylene oxide (oxirane)	C2H4O	75-21-8	10.56	9.0		
Ethylenediamine	C2H8N2	107-15-3	8.60	10		SV X
Ethyleneimine	C2H5N	151-56-4	9.20	2		S X
Ethylhexanal, 2-	C8H16O	123-05-7	~9	1.5		

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)		Notes
				10.6 eV		
Ethylhexanoic acid, 2-	C8H16O2	149-57-5	~10	5		
Ethylhexenal, 2-	C8H14O	645-62-5	~9	1.3		
Ethylmorpholine, 4-	C6H13NO	100-74-3	~8	3		S X
Eucalyptol	C10H18O	470-82-6	~9	0.6		
Eugenol	C10H12O2	97-53-0	~9	0.4		
Eugenol methyl ether	C11H14O2	93-15-2	~9	0.4		
Fenchol	C10H18O	1632-73-1	~9	0.4		
Ferrocene	C10H10Fe	102-54-5	6.88	0.8		
Fluorine	F2	7782-41-4	15.70	ZR		
Fluoro-2-propanone, 1-	C3H5FO	430-51-3	9.92	ZR		
Fluorobenzene	C6H5F	462-06-6	9.20	0.74		
Fluorobenzoic acid, 4-	C7H5FO2	456-22-4	9.91	2		
Fluoroethane	C2H5F	353-33-6	11.78	ZR		
Fluoromethane	CH3F	593-53-3	12.47	ZR		
Formaldehyde	CH2O	50-00-0	10.87	ZR		
Formamide	CH3ON	75-12-7	10.20	2		
Formic acid	CH2O2	64-18-6	11.05	ZR		
Furan	C4H4O	110-00-9	8.88	0.4		
Furfural	C5H4O2	98-01-1	9.21	0.8		
Furfuryl alcohol	C5H6O2	98-00-0	~9.9	2		
Furfuryl mercaptan	C5H6OS	98-02-2	~9	0.8		
Gasoline		8006-61-9	~9.9	0.9		
Geranial	C10H16O	141-27-5	~9	0.6		
Geraniol	C10H18O	106-24-1	~9	0.7		
Geranyl acetate	C12H20O2	105-87-3	~9	1.2		
Germane	GeH4	7782-65-2	11.34	10		
Glutaraldehyde (1,5-pentanedial)	C5H8O2	111-30-8	~9.6	0.9		
Glycidol (2,3-epoxypropanol)	C3H6O2	556-52-5	~10.8	ZR		
Glycidyl methacrylate	C7H10O3	106-91-2	~10	1.2		
Glycolaldehyde	C2H4O2	141-46-8	~10.4	5		
Glyoxal	C2H2O2	107-22-2	10.20	1		
Guaiaicol (2-methoxyphenol)	C7H8O2	90-05-1	~9	0.8		
Halothane (fluothane, 2-bromo-2-chloro-1,1,1-trifluoroethane)	CF3CHBrCl	151-67-7	11.00	ZR		
Helium	He	7440-59-7	24.59	ZR		
Heptan-2-one	C7H14O	110-43-0	9.33	0.85		
Heptan-3-one	C7H14O	106-35-4	9.02	0.73		
Heptan-4-one	C7H14O	123-19-3	9.10	0.9		
Heptane	C7H16	142-82-5	9.92	2.2		
Heptanol	C7H16O	53535-33-4	~9.8	1.7		
Heptene, 1-	C7H14	592-76-7	9.34	0.88		
Heptylcyclopentan-1-one, 2-	C12H22O	137-03-1	~9	0.8		
Heptyne, 1-	C7H12	628-71-7	10.04	2		
Hex-1-en-3-ol	C6H12O	4798-44-1	~9	0.9		
Hexachlorodisilane	Cl6Si2	13465-77-5	10.40	8		
Hexachloroethane (R-110)	C2Cl6	67-72-1	11.22	ZR		
Hexafluoroethane (R-116)	C2F6	76-16-4	13.60	ZR		
Hexafluoropropylene	C3F6	116-15-4	10.60	NR		

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Hexamethyldisilazane, 1,1,1,3,3,3- (HMDS, hexamethylsilazane)	C6H18NSi2	999-97-3	8.60	0.45	
Hexamethyldisiloxane	C6H18OSi2	107-46-0	9.60	0.3	
Hexamethylene diisocyanate	C8H12N2O2	822-06-0	~9	1.5	
Hexamethyleneimine	C6H13N	111-49-9	8.41	1.1	S X
Hexan-2-one	C6H12O	591-78-6	9.34	0.8	
Hexane	C6H14	110-54-3	10.13	3	
Hexanoic acid	C6H12O2	142-62-1	10.12	4	
Hexanol	C6H14O	111-27-3	9.89	2.0	
Hexene, 1-	C6H12	592-41-6	9.44	0.98	
Hexenyl acetate, cis-3-	C8H14O2	3681-71-8	~9	1.0	
Hexenyl butyrate, cis-3-	C10H18O2	16491-36-4	~9	1.5	
Hexylaldehyde (hexanal)	C6H12O	66-25-1	9.72	1.2	
Hydrazine	H4N2	302-01-2	8.93	3	
Hydrazoic acid	HN3	7782-79-8	10.72	ZR	
Hydrogen	H2	1333-74-0	15.43	ZR	
Hydrogen bromide	HBr	10035-10-6	11.62	ZR	
Hydrogen chloride	HCl	7647-01-0	12.74	ZR	
Hydrogen cyanide	HCN	74-90-8	13.60	ZR	
Hydrogen fluoride	HF	7664-39-3	15.98	ZR	
Hydrogen iodide	HI	10034-85-2	10.39	5	
Hydrogen peroxide	H2O2	7722-84-1	~11.7	ZR	
Hydrogen selenide	H2Se	7783-07-5	9.88	2	
Hydrogen sulphide	H2S	7783-06-4	10.46	4	
Hydrogen telluride	H2Te	7783-09-7	9.14	2	
Hydroxybutanal, 3-	C4H6O2	107-89-1	~9	2	
Hydroxycitronellal	C10H20O2	107-75-5	~9	1.0	
Hydroxyethyl acrylate	C5H8O3	818-61-1	~10	1.2	
Hydroxylamine	H3NO	7803-49-8	10.00	2	
Hydroxypropyl acrylate, 2-	C6H10O3	999-61-1	~9	1.5	
Indene	C9H8	95-13-6	8.81	0.5	
Indole	C8H7N	120-72-9	7.76	0.4	
Iodine	I2	7553-56-2	9.31	0.2	
Iodobenzene	C6H5I	591-50-4	8.73	0.2	
Iodoethene (vinyl iodide)	C2H3I	593-66-8	9.30	1.2	
Iodoform (triiodomethane)	CHI3	75-47-8	9.25	1.5	
Iodomethane (methyl iodide)	CH3I	74-88-4	9.54	0.4	
Isoalkanes, C10-C13	C8H18O	68551-17-7	~9.6	1	
Isoamyl acetate	C7H14O2	123-92-2	~9.7	1.5	
Isoamyl salicylate	C12H16O3	87-20-7	~9	1	
Isoamylene	C5H10	513-35-9	8.69	0.82	
Isobornyl acetate	C12H20O2	125-12-2	~9	0.5	
Isobutane	C4H10	75-28-5	10.57	8	
Isobutanol	C4H10O	78-83-1	10.12	3	
Isobutyl acetate	C6H12O2	110-19-0	9.90	2.0	
Isobutyl acrylate	C7H12O2	106-63-8	~9.5	1.2	
Isobutylamine	C4H11N	78-81-9	0.00	1	SVX
Isobutylbenzene	C10H14	538-93-2	8.68	0.4	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Isobutylene	C4H8	115-11-7	9.24	1	
Isobutylene epoxide	C4H8O	558-30-5	10.00	3	
Isobutyraldehyde	C4H8O	78-84-2	9.74	1.2	
Isobutyric acid	C4H8O2	79-31-2	10.24	4.4	
Isocyanic acid	HNCO	75-13-8	11.60	NR	
Isodecanol	C10H22O	25339-17-7	~9.8	0.9	
Isodihydrolavandulal	C10H18O	35158-25-9	0.00	0.7	
Isoeugenol	C10H12O2	97-54-1	~9	0.4	
Isoflurane	C3H2ClF5O	26675-46-7	~11	ZR	
Isoheptane	C7H16	591-76-4	9.84	1.2	
Isojasmone	C11H18O	95-41-0	~9	0.7	
Isomenthone	C10H18O	1196-31-2	9.86	0.6	
Isononanal	C9H18O	5435-64-3	~9.6	0.9	
Isononanol	C9H20O	3452-97-9	~9.8	1.5	
Isooctane	C8H18	540-84-1	9.86	1.1	
Isooctanol (2,2,4-trimethylpentane)	C8H18O	26952-21-6	~9.8	1.7	
Isopentane	C5H12	78-78-4	10.32	4	
Isopentanol	C5H12O	137-32-6	9.86	2.0	
Isopentene	C5H10	563-46-2	9.12	0.8	
Isophorone	C9H14O	78-59-1	9.07	0.8	
Isophorone diisocyanate	C12H18N2O2	4098-71-9	~9	0.6	
Isoprene (2-methyl-1,3-butadiene)	C5H8	78-79-5	8.85	0.9	
Isopropanol (IPA, 2-propanol)	C3H8O	67-63-0	10.17	4.0	
Isopropanolamine	C3H9NO	78-96-6	~9.6	1.5	SVX
Isopropoxyethanol, 2-(ethylene glycol isopropyl ether)	C5H12O2	109-59-1	~10.3	1.2	
Isopropyl acetate	C5H10O2	108-21-4	9.99	2.4	
Isopropyl chloroformate	C4H7O2Cl	108-23-6	~10.2	1.6	
Isopropyl mercaptan	C3H8S	75-33-2	9.15	0.6	
Isopropyl nitrite	C3H7NO2	541-42-4	10.23	4.0	
Isopropylamine	C3H9N	75-31-0	8.72	1	SVX
Isopropylaminoethanol, 2-	C5H13NO	109-56-8	~9	2	
Isopropylcyclohexane	C9H18	696-29-7	9.33	0.7	
Isopropylglycol acetate	C7H14O2	19234-20-9	~9.5	1.2	
Isothiazole	C3H3NS	288-16-4	9.55	3	
Isovaleraldehyde	C5H10O	590-86-3	9.72	1.3	
Isovaleric Acid	C5H10O2	503-74-2	~10.2	5.5	
Isoxazole	C3H3NO	288-14-2	9.96		
Jasmal	C11H22O3	1322-17-4	~9	1.4	
Jasmone, cis-	C11H16O	488-10-8	~9	0.5	
Jet Fuel Jp-4 (Jet B, wide cut aviation fuel)			~9	0.8	
Jet Fuel Jp-5 (kerosene aviation fuel)			~9	0.7	
Jet Fuel Jp-8 (kerosene aviation fuel)			~9	0.7	
Kerosene (C10-C16)		8008-20-6	~8	0.8	
Ketene	C2H2O	463-51-4	9.62	3	
Krypton	Kr	7439-90-9	14.00	ZR	
Linalool oxide	C10H18O2	14049-11-7	~9	0.6	
Linalyl acetate	C12H20O2	115-95-7	~9	1.1	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Liquefied petroleum gas (LPG, predominantly propane & butanes)		68476-85-7	10.95	ZR	
Maleic anhydride (furan-2,5-dione)	C4H2O3	108-31-6	9.90	2	
Menthol	C10H20O	1490-04-6	~9	0.5	
Menthone	C10H18O	89-80-5	~9	0.4	
Mercaptoacetic acid	C2H4O2S	68-11-1	~9.8	1	
Mercury	Hg	7439-97-6	10.44	NV	
Metaldehyde	C8H16O4	108-62-3	~9.7	2	
Methacrylamide	C4H7NO	79-39-0	~10	2	
Methacrylic acid	C4H6O2	79-41-4	10.15	2.3	
Methacrylonitrile	C4H5N	126-98-7	10.34	5	
Methane (natural gas)	CH4	74-82-8	12.51	ZR	
Methanol	CH4O	67-56-1	10.85	ZR	
Methoxy-1-butanol, 3-	C5H12O2	2517-43-3	~9.56	3	
Methoxy-1-propanol, 2-	C4H10O2	1589-47-5	9.30	2	
Methoxy-2,2-dimethylpropane (methyl neopentyl ether)	C6H14O	1118-00-9	9.30	0.9	
Methoxybutyl acetate, 3-	C7H14O3	4435-53-4	~9	2	
Methoxyethane (methyl ethyl ether)	C3H8O	540-67-0	9.72	1.0	
Methoxyethanol, 2- (methyl cellosolve®, ethylene glycol monomethyl ether, EGME)	C3H8O2	109-86-4	9.60	2.7	
Methoxyethene (methyl vinyl ether)	C3H6O	107-25-5	8.95	1.0	
Methoxyethoxyethanol, 2- (diethylene glycol monomethyl ether)	C5H12O3	111-77-3	10.00	1.4	
Methoxyethyl acetate, 2-	C5H10O3	110-49-6	~9.6	5	
Methoxyethyl ether, 2- (diglyme, diethylene glycol dimethyl ether)	C6H14O3	111-96-6	9.80	1.0	
Methoxymethylethoxy-2-propanol (DPGME)	C7H16O3	34590-94-8	XXX	1.3	
Methoxypropan-2-ol, 1- (1M2P, PGME, propylene glycol methyl ether)	C4H10O2	107-98-2	~9.6	1.6	
Methoxypropane, 2-	C4H10O	598-53-8	9.45	1.2	
Methoxypropyl acetate (PGMEA, propylene glycol methyl ether acetate)	C6H12O3	108-65-6	~9	1.6	
Methyl acetate	C3H6O2	79-20-9	10.27	7	
Methyl acetoacetate	C5H8O3	105-45-3	9.81	3	
Methyl acrylate	C4H6O2	96-33-3	10.25	3.6	
Methyl anthranilate	C8H9NO2	134-20-3	~9	0.4	
Methyl benzoate	C8H8O2	93-58-3	9.32	1.2	
Methyl bromide (bromomethane)	CH3Br	74-83-9	10.54	1.9	
Methyl cyanoacrylate	C5H5O2N	137-05-3	10.98	ZR	
Methyl dimethylacrylate	C6H10O2	924-50-5	~9.6	2.5	
Methyl ethyl ketone (MEK, Butan-2-one)	C4H8O	78-93-3	9.51	0.96	
Methyl ethyl ketone peroxides (MEKP)	C8H18O6	1338-23-4	~9	0.8	
Methyl formate	C2H4O2	107-31-3	10.82	ZR	
Methyl heptyne carbonate	C9H14O2	111-12-6	~9	1.3	
Methyl ionone	C14H22O	1335-46-2	~9	0.4	
Methyl isobutyl ketone (MIBK, 4-methylpentan-2-one)	C6H12O	108-10-1	9.30	0.9	
Methyl isocyanate	C2H3NO	624-83-9	10.67	5	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)		Notes
				10.6 eV		
Methyl isopropyl ketone (MIPK, 2-methylbutan-3-one)	C5H10O	563-80-4	9.31	0.99		
Methyl isothiocyanate	C2H3NS	556-61-6	9.25	0.6		
Methyl mercaptan	CH4S	74-93-1	9.44	0.7		
Methyl methacrylate	C5H8O2	80-62-6	9.70	1.31		
Methyl perfluorobutyl ether	C5H3F9O	163702-07-6	~11	NR		
Methyl phenyl acetate	C9H10O2	101-41-7	~9	0.4		
Methyl propargyl ether	C4H6O	627-41-8	9.78	2		
Methyl propionate	C4H8O2	554-12-1	10.15	3.8		
Methyl propionate	C4H8O2	554-12-1	10.15	3.8		
Methyl propynoate	C4H4O2	922-67-8	10.30	10		
Methyl salicylate	C8H8O3	119-36-8	7.65	0.8		
Methyl sulphide (DMS, dimethyl sulphide)	C2H6S	75-18-3	8.69	0.8		
Methyl tert-butyl ether (MTBE)	C5H12O	1634-04-4	9.24	1.0		
Methyl thiocyanate	C2H3NS	556-64-9	9.96	2.2		
Methyl thioglycolate	C3H6O2S	2365-48-2	~10	2		S
Methyl undecanal, 2-	C12H24O	110-41-8	~9	1.0		
Methyl vinyl ketone	C4H6O	78-94-4	9.65	0.6		
Methyl-1-butene, 3-	C5H10	563-45-1	9.51	0.8		
Methyl-2-butanol, 3-	C5H12O	598-75-4	9.88	3.3		
Methyl-2-butenal, 3-	C5H8O	107-86-8	~9	1.00		
Methyl-2-hexenoic acid, trans-3-	C7H12O2	027960-21-0	~10	1.5		
Methyl-2-methylpropanoate	C5H10O2	547-63-7	9.86	2		
Methyl-2-propen-1-ol, 2-	C4H8O	513-42-8	9.24	1.3		
Methyl-2-pyrrolidinone, N- (NMP, N-methylpyrrolidone)	C5H9NO	872-50-4	9.17	0.9		
Methyl-5-hepten-2-one, 6-	C8H14O	110-93-0	~9.4	0.63		
Methylamine	CH5N	74-89-5	8.97	1.5		S X
Methylbutan-1-ol, 3-	C5H12O	123-51-3	9.80	2.3		
Methylbutanal, 2-	C5H10O	96-17-3	9.59	1.2		
Methylbutyric acid, 2-	C5H10O2	116-53-0	~10.2	6		
Methylchloroformate	C2H3O2Cl	79-22-1	11.36	ZR		
Methylcyclohexane	C7H14	108-87-2	9.85	1.1		
Methylcyclohexanol	C7H14O	25639-42-3	9.80	2.4		
Methylcyclohexanol, 4-	C7H14O	589-91-3	9.80	2.4		
Methylcyclohexanone, 2-	C7H12O	583-60-8	9.05	1.0		
Methylcyclopentane	C6H12	96-37-7	9.85	1.5		
Methylenepentane, 3-	C6H12	760-21-4	9.06	0.9		
Methylheptan-3-one, 5- (Amyl ethyl ketone)	C8H16O	541-85-5	~9.1	0.77		
Methylhexan-2-one, 5- (MIAK, methyl isoamyl ketone)	C7H14O	110-12-3	9.28	0.7		
Methylhydrazine	CH6N2	60-34-4	8.00	1.3		
Methylmorpholine, N-	C5H11NO	109-02-4	~9.5	1.2		
Methylpent-3-en-2-one, 4-	C6H10O	141-79-7	9.10	0.6		
Methylpentan-2-ol, 4- (MIBC, methyl isobutylcarbinol)	C6H14O	108-11-2	~9.8	1.4		
Methylpentane, 2-	C6H14	107-83-5	10.12	3.0		
Methylpentane, 3-	C6H14	96-14-0	10.08	2.5		
Methylpentane-2,4-diol, 2- (hexylene glycol)	C6H14O2	107-41-5	~9.6	4		
Methylpropanoyl chloride, 2-	C4H7ClO	79-30-1	~9	8		
Methylpyrrole, N-	C5H7N	96-54-8	7.95	0.9		

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)		Notes
				10.6 eV		
Methylstyrene	C9H10	25013-15-4	8.30	0.5		
Methylthiopropional, 3-	C4H8OS	3268-49-3	~9.5	2		
Mineral oil		8042-47-5	~9	0.8		
Mineral spirits (Stoddard solvent, Varsol, Viscor)		64475-85-0	~9	0.8		
Monoisobutanolamine	C4H11NO	124-68-5	~9	1.6		
Morpholine	C4H9NO	110-91-8	8.88	4		SVX
Myrcene (7-methyl-3-methylene-1,6-octadiene)	C10H16	123-35-3	~8.2	0.5		
Naphtha, heavy aromatic		64742-94-5	~9	0.4		
Naphtha, hydrotrated heavy	CnH(2n+2)	64742-48-9	~10	1		
Naphtha, light aromatic		64742-95-6	~9	0.5		
Naphtha, medium aliphatic		64742-88-7	~9	0.8		
Naphthalene	C10H8	91-20-3	8.14	0.4		
Naphthol methyl ether, 2-	C11H10O	93-04-9	~9	0.5		
Neon	Ne	09-01-7440	21.56	ZR		
Neopentane	C5H12	463-82-1	10.21	3		
Neopentyl alcohol	C5H12O	75-84-3	9.72	2		
Nitric oxide	NO	10102-43-9	9.27	8		
Nitrobenzene	C6H5NO2	98-95-3	9.92	1.7		
Nitroethane	C2H5NO2	79-24-3	10.88	ZR		
Nitrogen	N2	7727-37-9	15.58	NR		
Nitrogen dioxide	NO2	10102-44-0	9.58	13		
Nitrogen trifluoride	NF3	7783-54-2	12.97	ZR		
Nitromethane	CH3NO2	75-52-5	11.08	ZR		
Nitropropane, 1-	C3H7NO2	108-03-2	10.81	ZR		
Nitropropane, 2-	C3H7NO2	79-46-9	10.71	ZR		
Nitrous oxide	N2O	10024-97-2	12.89	ZR		
N-Methylolacrylamide	C4H7NO2	924-42-5	~10.3	2		
Nonanal	C9H18O	124-19-6	~9	1.3		
Nonane	C9H20	111-84-2	9.72	1.4		
Nonanol (mixed isomers)	C9H20O	143-08-8	~9.8	1.2		
Nonene (mixed isomers)	C9H18	27215-95-8	~9.3	0.6		
Nonene, 1-	C9H18	124-11-8	~9.4	0.6		
Norbornadiene, 2,5-	C7H8	121-46-0	8.38	0.6		
Octalactone, gamma-	C8H14O	104-50-7	~9	3		
Octamethylcyclotetrasiloxane	C6H12O4Si4	556-67-2	~10	0.3		
Octamethyltrisiloxane	C8H24O2Si3	107-51-7	10.04	0.3		
Octane	C8H18	111-65-9	9.80	1.6		
Octanol (mixed isomers) (capryl alcohol, octyl alcohol)	C8H18O	111-87-5	~9.8	1.5		
Octene (mixed isomers)	C8H16	25377-83-7	~9.4	0.7		
Octene, 1-	C8H16	111-66-0	9.43	0.7		
Oxalonitrile	C2N2	460-19-5	13.57	ZR		
Oxaly bromide	C2Br2O2	15219-34-8	10.49	5		
Oxydiethanol, 2,2'- (diethylene glycol)	C4H10O3	111-46-6	~10.3	2		
Oxygen	O2	7782-44-7	12.07	ZR		
Ozone	O3	10028-15-6	12.52	ZR		
Paraffin wax, fume		8002-74-2	~10	1		
Paraffins, normal		64771-72-8	~9.5	1		

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Paraldehyde	C6H12O3	123-63-7	~9.7	2.2	
Pentacarbonyl iron	FeC5O5	13463-40-6	~8	1	
Pentachloroethane	C2HCl5	76-01-7	11.28	ZR	
Pentachlorofluoroethane	C2Cl5F	354-56-3	~11.8	ZR	
Pentafluoroethane	C2HF5	354-33-6	~12.5	ZR	
Pentan-2-one (MPK, methyl propyl ketone)	C5H10O	107-87-9	9.38	0.99	
Pentan-3-one (diethyl ketone)	C5H10O	96-22-0	9.31	0.77	
Pentanal (pentyl aldehyde)	C5H10O	110-62-3	9.74	1.5	
Pentandione, 2,4- (acetyl acetone)	C5H8O2	123-54-6	8.85	1.2	
Pentane	C5H12	109-66-0	10.35	7	
Pentanoic acid	C5H10O2	109-52-4	10.53	8.0	
Pentanol, 2-	C5H12O	6032-29-7	9.78	2.0	
Pentanol, 3-	C5H12O	584-02-1	9.76	1.7	
Pentene, 1-	C5H10	109-67-1	9.49	0.92	
Pentylcyclopentan-1-one, 2-	C10H18O	4819-67-4	~9	1.0	
Pentylcyclopentane	C10H20	3741-00-2	9.91	1.1	
Pentyne, 1-	C5H8	627-19-0	10.10	3	
Peracetic acid	C2H4O3	79-21-0	~10.5	NA	
Perchloryl fluoride (chlorine oxyfluoride)	ClO3F	7616-94-6	13.60	ZR	
Perfluorocyclobutane (hexafluorobutadiene)	C4F8	115-25-3	13.50	ZR	
Perfluoropropane	C3F8	76-19-7	13.38	ZR	
Perfluoro-tert-butylamine	C4H2F9N	2809-92-9	10.40	5	
Petroleum ether (Ligroin, VM&P naphtha, benzine)		8032-32-4	~10	0.9	
Phellandrene	C10H16	99-83-2	~8.2	0.8	
Phenethyl methyl ether, 2-	C9H12O	3558-60-9	~9	0.6	
Phenol (hydroxybenzene)	C6H6O	108-95-2	8.51	0.9	
Phenoxyethanol, 2-	C8H10O2	122-99-6	~8.5	4.5	S
Phenyl chloroformate	C7H5ClO2	1885-14-9	~9	1.1	
Phenyl ethyl isobutyrate, 2-	C12H16O2	103-48-0	~9	1.5	
Phenyl propene, 2-	C9H10	98-83-9	8.35	0.4	
Phenyl-2,3-epoxypropyl ether (PGE)	C9H10O2	122-60-1	~8.6	0.8	
Phenylacetaldehyde	C8H8O	122-78-1	8.80	0.7	
Phenylacetic acid	C8H8O2	103-82-2	8.26	1	
Phenylcyclohexane	C12H16	827-52-1	8.10	0.4	
Phenylethyl acetate, 1-	C10H12O2	93-92-5	~9	0.7	
Phenylethyl alcohol, 2-	C8H10O	60-12-8	~10	1.2	
Phosgene	COCl2	75-44-5	11.55	ZR	
Phosphine	PH3	7803-51-2	9.96	2	
Phthalonitrile	C8H5N2	91-15-6	9.90	1.2	
Picoline, 3- (3-methylpyridine)	C6H7N	108-99-6	9.04	0.7	
Pine oil	N/A	8002-09-3	~9.5	1.0	
Pinene	C10H16	80-56-8	8.07	0.4	
Pinene, α-	C10H16	2437-95-8	8.07	0.34	
Pinene, β-	C10H16	127-91-3	8.10	0.5	
Piperazine (1,4-diazacyclohexane)	C4H10N2	110-85-0	8.72	0.8	
Piperidine (azacyclohexane)	C5H11N	110-89-4	8.03	1	S X
Piperylene (1,3-pentadiene)	C5H8	504-60-9	8.60	0.9	
Prop-2-yn-1-ol (propargyl alcohol)	C3H4O	107-19-7	10.50	3.7	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Propadiene (allene)	C3H4	463-49-0	9.83	1.0	
Propan-1-ol	C3H8O	71-23-8	10.20	5.4	
Propanamide	C3H7NO	79-05-0	~9.5	2	
Propane	C3H8	74-98-6	11.07	ZR	
Propane-1,2-diol (propylene glycol)	C3H8O2	57-55-6	10.00	3	
Propanolamine	C3H9NO	156-87-6	~9.5	1.5	SVX
Propargyl chloride (3-chloro-1-propyne)	C3H3Cl	624-65-7	9.82	8.4	
Propen-1-imine, 2-	C3H5N	73311-40-7	9.65	2	SVX
Propene (propylene)	C3H6	115-07-1	9.73	1.4	
Propiolic acid (2-propynoic acid)	C3H2O2	471-25-0	10.45	8	
Propionaldehyde (propanal, propional)	C3H6O	123-38-6	9.95	1.7	
Propionic acid	C3H6O2	79-09-4	10.44	10	
Propionitrile	C3H5NO	107-12-0	11.50	ZR	
Propoxy-2-propanol, 1-	C6H14O2	1569-01-3	~9.5	1.2	
Propyl acetate, n-	C5H10O2	109-60-4	10.04	3.0	
Propyl butanoate	C7H14O2	105-66-8	~9.6	1.3	
Propyl formate	C4H8O2	110-74-7	10.54	19	
Propyl iodide (Iodopropane)	C3H7I	107-08-4	9.26	1.0	
Propyl mercaptan	C3H8S	107-03-9	9.15	1.0	
Propylamine, n-	C3H9N	107-10-8	8.50	1.1	SX
Propylbenzene (includes cumene)	C9H12	103-65-1	8.72	0.5	
Propylbenzene (all isomers)	C9H12	74296-31-4	8.70	0.5	
Propylbenzene, 2-	C9H12	98-82-8	8.71	0.6	
Propylene carbonate	C4H6O3	108-32-7	~10.5	15	
Propylene dinitrate	C3H6N2O6	6423-43-4	~11	ZR	
Propylene glycol ethyl ether acetate (PGEEA)	C7H14O3	98516-30-4	~9.6	1.2	
Propylene oxide	C3H6O	75-56-9	10.22	6	
Propyleneimine (2-methylaziridine)	C3H7N	75-55-8	9.00	1.4	SX
Propylnitrate, n-	C3H7NO3	627-13-4	11.07	ZR	
Propyne (methylacetylene)	C3H4	74-99-7	10.36	4	
Pyrazine	C4H4N2	290-37-9	9.29	3	
Pyridine	C5H5N	110-86-1	9.25	0.7	
Pyridinol, 4-	C5H5NO	626-64-2	9.75	3	
Pyridylamine, 2-	C5H6N2	504-29-0	8.10	0.8	
Pyrrrole	C4H5N	109-97-7	8.02	1.4	
Pyrrrolidine	C4H9N	123-75-1	8.77	4	SVXW!
Pyruvaldehyde	C3H4O2	78-98-8	9.60	0.7	
Rose oxide, cis-	C10H18O	16409-43-1	~9	0.8	
Sec-amyl acetate	C7H14O2	626-38-0	~9.9	5	
Sevoflurane (1,1,1,3,3,3-hexafluoro-2-(fluoromethoxy)propane)	C3H3F7O	28523-86-6	11.00	ZR	
Silane	SiH4	7803-62-5	11.00	ZR	
Stibine (vinylbenzene)	SbH3	7803-52-3	9.89	1.5	
Styrene	C8H8	100-42-5	8.40	0.45	
Sulphur dichloride	Cl2S	10545-99-0	9.47	2	
Sulphur dioxide	SO2	7446-09-5	12.30	ZR	
Sulphur hexafluoride	SF6	2551-62-4	19.30	ZR	
Sulphur tetrafluoride	SF4	7783-60-0	12.63	ZR	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Sulphuryl fluoride	SO ₂ F ₂	2699-79-8	13.04	ZR	
TAC (Total Aromatic Hydrocarbons)			~9	NA	
Terpineol, α-	C ₁₀ H ₁₈ O	98-55-5	~9	0.8	
Terpinolene	C ₁₀ H ₁₆	586-62-9	8.10	0.6	
Terpinyl acetate, α-	C ₁₂ H ₂₀ O ₂	80-26-2	~9	1.2	
Terpinyl methyl ether, alpha-	C ₁₁ H ₂₀ O	14576-08-0	~9	0.7	
Tert-amyl methyl ether	C ₆ H ₁₄ O	994-05-8	~9	0.8	
Tert-butanol (t-butyl alcohol)	C ₄ H ₁₀ O	75-65-0	10.25	1.6	
Tert-butyl acetate	C ₆ H ₁₂ O ₂	540-88-5	~9.7	1.05	
Tert-butyl bromide	C ₄ H ₉ Br	507-19-7	9.92	0.99	
Tert-butyl formate (2-methyl-2-bromopropane)	C ₅ H ₁₀ O ₂	762-75-4	10.52	8	
Tetrabromoethane, 1,1,2,2-	C ₂ H ₂ Br ₄	79-27-6	~10	2	
Tetracarbonylnickel (nickel tetracarbonyl)	NiC ₄ O ₄	13463-39-3	8.28	1	
Tetrachloro-1,2-difluoroethane, 1,1,2,2-	C ₂ Cl ₄ F ₂	76-12-0	11.30	ZR	
Tetrachloro-1-fluoroethane, 1,1,2,2-	C ₂ HCl ₄ F	354-14-3	~11	ZR	
Tetrachloro-2,2-difluoroethane, 1,1,1,2-	C ₂ Cl ₄ F ₂	76-11-9	~11	ZR	
Tetrachloro-2-fluoroethane, 1,1,1,2-	C ₂ HCl ₄ F	354-11-0	~11	ZR	
Tetrachloroethane, 1,1,1,2-	C ₂ H ₂ Cl ₄	630-20-6	11.10	ZR	
Tetrachloroethane, 1,1,2,2- (R-130)	C ₂ H ₂ Cl ₄	79-34-5	11.10	ZR	
Tetrachloroethylene (PCE, perchloroethylene)	C ₂ Cl ₄	127-18-4	9.33	0.4	
Tetrachloropyridine, 2,3,5,6-	C ₅ HNC ₄	2402-79-1	~9	1	
Tetraethyl orthosilicate (TEOS, ethyl orthosilicate, ethyl silicate)	C ₈ H ₂₀ O ₄ Si	78-10-4	9.77	3	W!
Tetraethyllead (TEL)	C ₈ H ₂₀ Pb	78-00-2	11.10	ZR	
Tetrafluoroethane, 1,1,1,2-	C ₂ H ₂ F ₄	811-97-2	~12.2	ZR	
Tetrafluoroethane, 1,1,2,2-	C ₂ H ₂ F ₄	359-35-3	~12.2	ZR	
Tetrafluoroethylene (R-1114)	C ₂ F ₄	116-14-3	10.12	15	
Tetrafluoromethane (Carbon tetrafluoride)	CF ₄	75-73-0	15.30	ZR	
Tetrahydrofuran (THF)	C ₄ H ₈ O	109-99-9	9.41	2.3	
Tetrahydronaphthalene (Tetralin)	C ₁₀ H ₁₂	119-64-2	8.46	0.4	
Tetrahydropyran	C ₅ H ₁₀ O	142-68-7	9.25	1.5	
Tetrahydrothiophene (Thiolane)	C ₄ H ₈ S	110-01-0	8.38	0.7	
Tetramethyl orthosilicate (TMOS, methyl orthosilicate, methyl silicate)	C ₄ H ₁₂ O ₄ Si	681-84-5	~10	2	W!
Tetramethyl succinonitrile (TMSN)	C ₈ H ₁₂ N ₂	3333-52-6	~11	NA	
Tetramethylbenzene (all isomers)	C ₁₀ H ₁₄	95-93-2	8.06	0.3	
Tetramethylbutane, 2,2,3,3-	C ₈ H ₁₈	594-82-1	9.80	1	
Tetramethyldisiloxane, 1,1,3,3-	C ₄ H ₁₄ O ₂ Si ₂	3277-26-7	~9	0.7	
Tetramethylgermane	C ₄ H ₁₂ Ge	865-52-1	9.34	2	
Tetramethylguanidine, N,N,N',N'	C ₅ H ₁₃ N ₃	80-70-6	8.43	0.6	
Tetramethylsilane (TMS)	C ₄ H ₁₂ Si	75-76-3	9.80	2	
Thioacetic acid	C ₂ H ₄ OS	507-09-5	10.00	2	
Thioanisole	C ₇ H ₈ S	100-68-5	7.94	0.6	
Thiocarbonyl fluoride	CSF ₂	420-32-6	10.45	6	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Thiocyanogen	C2S2N2	505-14-6	10.50	8	
Thioformaldehyde trimer	C3H6S3	291-21-4	9.35	1.5	
Thionyl chloride	SOCl2	7719-09-7	10.96	ZR	
Thiophene	C4H4S	110-02-1	8.86	0.46	
Thiophosgene	CSCl2	463-71-8	9.61	1	
Thymol	C10H14O	89-83-8	~9	0.7	
Titanium-n-propoxide	C12H28O4Ti	3087-37-4	~9	3	
Toluene	C7H8	108-88-3	8.82	0.56	
Toluene-2,4-diisocyanate (TDI)	C9H6N2O2	584-84-9	8.82	1.6	
Toluenesulfonyl chloride, p- (tosyl chloride)	C7H7SO2Cl	98-59-9	~9	3	
Toluidine, o- (2-aminotoluene)	C7H9N	95-53-4	7.40	0.5	
Tolylaldehyde, p-	C8H8O	104-87-0	9.33	0.8	
Triazine, 1,3,5-	C3H3N3	290-87-9	10.01	6	
Tributyl phosphate	C12H27O4P	126-73-8	8.91	5	
Tributylamine	C12H27N	102-82-9	7.40	1	S X
Trichloro-1,1-difluoroethane, 1,2,2-	C2HCl3F2	354-21-2	11.00	ZR	
Trichloro-1,2-difluoroethane, 1,1,2-	C2HCl3F2	354-15-4	~11	ZR	
Trichloro-2,2-difluoroethane, 1,1,1-	C2HCl3F2	354-12-1	~11	ZR	
Trichloro-2-fluoroethane, 1,1,2- (R-131)	C2H2Cl3F	359-28-4	~11	ZR	
Trichlorobenzene, 1,2,4-	C6H3Cl3	120-82-1	9.04	0.6	
Trichloroethane, 1,1,1- (1,1,1-TCA, R-140)	C2H3Cl3	71-55-6	11.00	ZR	
Trichloroethane, 1,1,2- (1,1,2-TCA, R-140a)	C2H3Cl3	79-00-5	11.00	ZR	
Trichloroethylene	C2HCl3	79-01-6	9.45	0.6	
Trichlorofluoromethane	CCl3F	75-69-4	11.77	ZR	
Trichloronitromethane	CCl3NO2	76-06-2	~13	ZR	
Trichloropropane 1,2,3-	C3H5Cl3	96-18-4	~11	ZR	
Trichlorotrifluoroethane, 1,1,1- (R-113a)	C2Cl3F3	354-58-5	11.50	ZR	
Trichlorotrifluoroethane, 1,1,2- (R-113)	C2Cl3F3	76-13-1	11.99	ZR	
Triethyl borate	C6H15O3B	150-46-9	10.13	5	
Triethyl phosphate	C6H15P04	78-40-0	9.79	3.5	
Triethyl phosphite	C6H15O3P	122-52-1	8.30	1.5	
Triethyl silane	C6H16Si	617-86-7	9.50	2	
Triethylamine (TEA)	C6H15N	121-44-8	7.50	1.3	SV
Triethylbenzene	C12H18	25340-18-5	~8.3	0.4	
Triethylene aluminum	C6H15Al	97-93-8	~10	1	
Trifluoroacetic acid (TFAA)	C2HO2F3	76-05-1	11.46	NR	
Trifluoroethane, 1,1,2- (R-143)	C2H3F3	430-66-0	12.90	ZR	
Trifluoroethanol, 2,2,2-	C2H3F3O	75-89-8	~13	ZR	
Trifluoroethene (trifluoroethylene)	C2HF3	359-11-5	10.14	5	
Trifluoroethyl methyl ether, 2,2,2- (trifluoroethyl methyl ether)	C3H5F3O	460-43-5	10.53	10	
Trifluoroiodomethane	CF3I	2314-97-8	10.28	2	
Trifluoromethane (fluoroform)	CHF3	75-46-7	13.86	ZR	
Trimethoxymethane	C4H10O3	149-73-5	9.50	4	V
Trimethoxyvinylsilane	C5H12O3Si	2768-02-7	~9.5	2.0	
Trimethyl phosphate	C3H9O4P	512-56-1	10.00	4	SV X
Trimethylamine	C3H9N	75-50-3	7.82	0.5	SV X
Trimethylbenzene mixtures (mesitylene)	C9H12	25551-13-7	8.41	0.3	

Chemical Name	Formula	CAS no.	IE, eV	Lamp Type (RF)	Notes
				10.6 eV	
Trimethylbenzene, 1,2,4-	C9H12	95-63-6	0.00	0.6	
Trimethylbenzene, 1,3,5-	C9H12	108-67-8	8.39	0.4	
Trimethylborate	C3H9BO3	121-43-7	10.00	NA	
Trimethylcyclohexane, 1,2,4-	C9H18	2234-75-5	9.35	1.0	
Trimethylene oxide	C3H6O	503-30-0	9.65	1.5	
Trimethylsilane	C3H10Si	993-07-7	9.90	1	
Trioxane (formaldehyde trimer)	C3H6O3	110-88-3	10.30	2	
Tropathiane	C8H16OS	67715-80-4	0.00	0.46	
Tungsten hexafluoride	WF6	7783-82-6	15.53	ZR	
Turpentine	C10H16	9005-90-7	~8.5	0.6	
Turpentine oil (Pinenes)	C10H16	8006-64-2	~8	0.6	
TVOC (Total Volatile Organic Compounds)			~10	1	
Undecane	C11H24	1120-21-4	9.56	1.1	
Vanillin	C8H8O3	121-33-5	~9	1	
Vinyl acetate	C4H6O2	108-05-4	9.19	1.5	
Vinyl bromide (bromoethene)	C2H3Br	593-60-2	9.80	1.5	
Vinyl chloride (chloroethene)	C2H3Cl	75-01-4	9.99	2.1	
Vinyl ethyl ether	C4H8O	109-92-2	8.98	1.0	
Vinyl fluoride (fluoroethene)	C2H3F	75-02-5	10.37	2	
Vinyl-2-pyrrolidinone, 1- NVP	C6H9NO	88-12-0	9.00	4.5	
Vinylcyclohexene (butadiene dimer)	C8H12	100-40-3	8.93	0.47	
Vinylene carbonate	C3H2O3	872-36-6	10.08	3.5	
Vinylidene difluoride (vinylidene fluoride)	C2H2F2	75-38-7	10.29	5	
Vinylsilane	C2H6Si	7291-09-0	10.10	1.5	
Water (dihydrogen monoxide)	H2O	7732-18-5	12.61	ZR	
Xenon	Xe	7440-63-3	12.13	ZR	
Xylene mixed isomers (dimethylbenzenes)	C8H10	1330-20-7	8.56	0.54	
Xylene, m-	C8H10	108-38-3	8.56	0.5	
Xylene, o-	C8H10	95-47-6	8.56	0.5	
Xylene, p-	C8H10	106-42-3	8.44	0.55	
Xylidine, all	C8H11N	1300-73-8	7.50	0.7	

* Ionisation energies were primarily sourced from P.J. Linstrom and W.G. Mallard, Eds., **NIST Chemistry WebBook, NIST Standard Reference Database Number 69**, National Institute of Standards and Technology, Gaithersburg MD, 20899, <http://webbook.nist.gov>, (retrieved and updated from June 19, 2014).

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Technical/Application Article 02 Version 1.0 13th October 2020 WRH/FD/NJG from ION Science