

## Electron Volt (eV) Potential Chart for Industrial Gases

# UNDERSTANDING eV POTENTIAL PAPER

Every gas in the atmosphere has an electron volt potential. Understanding the relationship of power to eV is critical when designing air purification systems to produce the desired effect, while avoiding the formation of ozone and other by-products. GPS' Needlepoint bipolar ionization (NPBI) is uniquely different from corona discharge ionization systems. The power output is controlled to less than 12.07eV to prevent the formation of ozone.

The chart below itemizes the eV potential for 520 common industrial gases with an eV  $\leq$  12. Sources of the data include CRC Handbook of Chemistry and Physics, NIOSH Pocket Guide to Chemical Hazards, NIST Chemistry WebBook.

CHEMICAL NAME	IP (EV)	CHEMICAL NAME	IP (EV)	CHEMICAL NAME	IP (EV)
1,1,1-trichlorobutane	9.54	1,3-dibromopropane	10.07	1-iodopropane	9.26
1,1,1-trichloroethane	11.25	1,3-dichloropropane	10.85	1-octene	9.52
1,1,1-trifluoro-2-iodoethane	10.1	1,3-pentadiene	8.56	1-pentene	9.5
1,1,1-trifluoropropene	10.9	1,4-difluorobenzene	9.15	1-propanethiol	9.2
1,1,2,2-tetrachloroethane	11.1	1-bromo-2-chloroethane	10.63	1-thiopropanol	9.2
1,1,2-trifluoroethane	10.14	1-bromo-2-methylpropane	10.09	2,2,4,4-tetramethyl-3-pentanone	8.65
1,1-dibromoethane	10.19	1-bromo-3-hexanone	9.26	2,2,4-trimethyl pentane	9.85
1,1-dichloroethane	11.06	1-Bromopropene	9.3	2,2,4-trimethyl-3-pentanone	8.82
1,1-dichloroethene	10	1-bromobutane	10.13	2,2-dimethyl Butane-3,1	9.18
1,1-dichloroethylene	9.6	1-bromobutanone	9.54	2,2-dimethyl Propane	10.35
1,1-dichloropropanone	9.71	1-bromopentane	10.1	2,2-dimethyl-3-pentanone	8.98
1,1-dimethoxymethane	9.65	1-bromopropene	10.18	2, 2-dimethyl butane-3, 1	9.18
1,1-dimethylhydrazine	8.88	1-bromopropene	9.3	2,2-Dimethylbutane	10.06
1,2,3,4-tetrafluorobenzene	9.61	1-butanethiol	9.14	2,2-dimethylpropane	10.35
1,2,3,5-tetrafluorobenzene	9.55	1-butene	9.58	2,3-butadione	9.23
1,2,4,5-tetrafluorobenzene	9.39	1-butyne	10.18	2,3-dichloropropene	9.82
1,2,3-trimethylbenzene	8.48	1-chloro-2,3 epoxypropane	10.6	2,3-dimethyl-2-butene	8.3
1,2,4,5-tetramethylbenzene	8.03	1-chloro-2-bromoethane	10.63	2,3-dimethylbutadiene	8.72
1,2,4-trifluorobenzene	9.37	1-chloro-2-fluorobenzene	9.15	2,3-dimethylbutane	10.01
1,2,4-trimethylbenzene	8.27	1-chloro-2-methylbenzene	8.72	2,4-pentanedione	8.87
1,2-butadiene	9.57	1-chloro-2-methylpropane	10.66	2,4-xylidine	7.65
1,2-dibromopropane	10.26	1-chloro-3-fluorobenzene	9.21	2,2-dimethylbutane	10.05
1,2-dichlorobenzene	9.07	1-chloro-4-methylbenzene	8.78	2-Amino Pyridine	8
1,2-dichloroethane	11.04	1-chlorobutane	10.67	2-amino-pyridine	8.34
1,2-dichloropropane	10.87	1-chlorobutanone	9.54	2-bromo-2-methylpropane	9.98
1,2-dichloroethane	11.04	1-chloropropene	10.82	2-bromobutane	9.95
1,2-difluorobenzene	9.31	1-hexene	9.46	2-bromopropene	10.08
1,3,5-trifluorobenzene	9.3	1-iodo-2-methylpropane	9.18	2-bromopropene	10.06
1,3,5-trimethylbenzene	8.39	1-iodobutane	9.71	2-bromothiophene	8.63
1,3-butadiene	9.57	1-iodopentane	9.19	2-butanal	9.73



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2-butanol	10.1	Acetylene	11.4	Citral	0.5
2-butanone	9.53	Acetylene Dichloride	9.8	Crotonaldehyde	9.73
2-butyne	9.85	Acridene	7.78	Cumene	8.75
2-chloro-2-methylpropane	10.61	Acrolein	10.1	Cyanoethane	10.91
2-chlorobutane	10.65	Acrylaldehyde	10.10	Cyanogen Bromide	11.95
2-chloroethoxyethene	10.61	Acrylic Acid	10.09	Cyclobutane	10.5
2-chloropropane	10.78	Acrylonitrile	10.91	Cyclohexane	9.88
2-chlorothiophene	8.68	Allene	9.83	Cyclohexanol	10
2-decanone	9.4	Allyamine	9.6	Cyclohexanone	9.14
2-Furaldehyde	9.21	Allyl Alcohol	9.67	Cyclohexene	8.95
2-heptanone	9.33	Allyl Chloride	10.2	Cyclo-octateraene	7.99
2-hexanone	9.34	Aminoethanol	9.87	Cyclopentadiene	8.56
2-iodobutane	9.09	Ammonia	10.15	Cyclopentane	10.52
2-iodopropane	9.17	Aniline	7.7	Cyclopentanone	9.26
2-methyl Furan	8.39	Arsine	9.89	Cyclopentene	9.01
2-methyl-1,3-butadiene	8.85	Benzaldehyde	9.53	Cyclopropane	10.06
2-methyl-1-butene	9.12	Benzene	9.25	Cyclopropene	9.95
2-methyl-2-propanol	9.7	Benzenethiol	8.33	Decalin	10.41
2-methylbutanal	9.71	Benzonitrile	9.7	Decane	10.19
2-methylbutane	10.31	Benzotrifluoride	9.68	Dibromochloromethane	10.59
2-methylpentane	10.11	Benzyl Chloride	10.16	Dibromoethane	10.19
2-methylpropanal	9.74	Biphenyl	8.27	Dibromomethane	10.49
2-Methylpropane	10.56	Bromobenzene	8.98	Dibutylamine	7.69
2-methylpropene	9.23	Bromochloromethane	10.77	Dichlorofluoromethane	11.75
2-pentanone	9.39	Bromodichloromethane	10.88	Dichloromethane	11.35
2-propenal	10.10	Bromoethane	10.24	Dicyclopentadiene	7.74
2-propanone	9.69	Bromoethene	9.8	Diethoxymethane	9.7
3,3-dimethyl Butanone	9.17	Bromoforn	10.51	Diethyl	8.01
3,5-dimethyl-4-heptanone	9.04	Bromomethane	10.53	Diethyl Ether	9.53
3-bromopropene	9.7	Bromomethyl Ethyl Ether	10.08	Diethyl Ketone	9.32
3-butene nitrile	10.9	Bromoethene	9.8	Diethyl Sulfide	8.43
3-chloropropene	10.04	Butanal	9.83	Diethylamine	8.01
3-cyanopropene	10.39	Butane	10.63	Diethylamino Ethanol	8.58
3-methyl-1-butene	9.51	Butoxyethanol	2.8	Difluorodibromomethane	11.1
3-methyl-2-butene	8.67	Butyl Cellusolve	8.68	Difluoromethylbenzene	9.45
3-methylpentane	10.08	Caprolactam	9.86	Diiodomethane	9.34
3-methylpentane	10.07	Carbon Disulfide	10.08	Di-i-propyl Ether	9.2
3-octanone	9.19	Carbon Tetrachloride	11.47	Diisobutyl Ketone	9.04
3-pentanone	9.32	Chloroacetaldehyde	10.61	Diisopropylamine	7.73
4-heptanone	9.12	Chlorobenzene	9.07	Dimethoxymethane	10
4-methylcyclohexene	8.91	Chlorobromomethane	10.77	Dimethyl Disulfide	8.46
4-octanone	9.1	Chloroethane	10.97	Dimethyl Ether	10
4-vinylcyclohexene	8.93	Chloroethene	9.99	Dimethyl Sulfide	8.69
5-nonanone	9.1	Chloroform	11.42	Dimethylamine	8.24
2-butyne	9.85	Chloromethylethyl Ether	10.08	Dimethylaniline	7.14
Acetaldehyde	10.21	Chloromethylmethyl Ether	10.25	Di-n-propyl Disulfide	8.27
Acetamide	9.77	Chlorotrifluoroethane	10.4	Di-n-propyl Ether	9.27
Acetic Acid	10.66	cis-1,2-Dichloroethene	9.65	Di-n-propyl Sulfide	8.3
Acetic Chloride	11.02	cis-1,3-Pentadiene	8.59	Di-n-propylamine	7.84
Acetone	9.69	cis-1-chloro-2-fluoroethene	9.87	Dymethylamine	8.24
Acetophenone	9.27	cis-2-butene	9.13	Epichlorohydrin	10.6
Acetyl Bromide	10.55	cis-dichloroethane	9.65	Ethanal	11.65



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Ethane	11.65	Furfural	9.21	Methyl Butyrate	10.07
Ethanethiol (Ethyl Mercaptan)	9.29	Genetron 101	11.98	Methyl Chloride	11.28
Ethanal	10.21	Heptane	10.07	Methyl Chloroacetate	10.35
Ethanol	10.62	Hexafluoroacetone	11.81	Methyl Dichloroacetate	10.44
Ethanolamine	9.87	Hexafluorobenzene	9.39	Methyl Ethanoate	10.27
Ethene (Ethylene)	10.52	Hexafluoropropene	10.3	Methyl Ethyl Ether	9.81
Ethyl Acetate	10.11	Hexamethylbenzene	7.85	Methyl Ethyl Ketone (MEK)	9.53
Ethyl Aldehyde	10.21	Hexane	10.18	Methyl Ethyl Sulfide	8.55
Ethyl Amine	8.86	Hydrazine	9	Methyl Iodide	9.54
Ethyl Amyl Ketone	9.1	Hydrofluoric Acid	9.88	Methyl Isobutyl Ketone	9.32
Ethyl Bromide	10.29	Hydrogen Selenide	9.88	Methyl Isobutyrate	9.98
Ethyl Butyl Ketone	9.02	Hydrogen Sulfide	10.46	Methyl Isocyanate	10.67
Ethyl Chloride	10.97	Hydrogen Telluride	9.14	Methyl Isopropyl Ketone	9.32
Ethyl Chloroacetate	10.2	Iodine	9.28	Methyl Mercaptan	9.44
Ethyl Disulfance	9.4	Iodobenzene	8.73	Methyl Methacrylate	9.74
Ethyl Disulfide	8.27	Iodoethane (Ethyl Iodide)	9.33	Methyl Methanoate	10.82
Ethyl Ethanoate	10.1	Iodomethane (Methyl Iodide)	9.54	Methyl n-butyl ketone	9.34
Ethyl Ether	9.41	Isoamyl Acetate	9.9	Methyl n-propyl ketone	9.39
Ethyl Formate	10.61	Isoamyl Alcohol	10.16	Methyl Styrene	8.35
Ethyl Iodine	9.33	Isobutane	10.74	Methylamine	8.97
Ethyl Isothiocyanate	9.14	Isobutanol	10.12	Methylchloroform	11.25
Ethyl Mercaptan	9.29	Isobutyl Acetate	9.97	Methylcyclohexane	9.85
Ethyl Methanoate	10.61	Isobutyl Alcohol	10.12	Methylcyclohexanol	9.8
Ethyl Methyl Sulfide	8.55	Isobutyl Formate	10.46	Methylcyclohexanone	9.05
Ethyl Nitrate	11.22	Isobutyl Mercaptan	9.12	Methylcyclopropane	9.52
Ethyl Propanoate	10	Isobutyl Methanoate	10.46	Methylene Chloride	11.35
Ethyl Trichloroacetate	10.44	Isobutylamine	8.7	Methyl-tert-butylether	10
Ethylamine	8.86	Isobutylbenzene	8.68	m-fluorotoluene	8.91
Ethylbenzene	8.76	isobutylene	9.44	m-iodotoluene	8.61
Ethylbenzene	8.87	isobutyraldehyde	9.74	mono-fluorobenzene	9.2
Ethylene	10.52	Isopentane	10.32	mono-fluoroethene	10.37
Ethylene Chloride	9.2	Isoprene	8.85	Mono-fluoromethanal	11.4
Ethylene Chlorohydrin	10.9	Isopropanol	10.16	Morpholine	8.88
Ethylene Dibromide	9.45	Isopropyl Acetate	9.99	m-xylene	8.56
Ethylene Dibromide	10.37	Isopropyl Ether	9.2	N,N-diethyl formamide	9.12
Ethylene Dichloride	11	Isopropylamine	8.72	n-propyl mercaptan	9.2
Ethylene Dichlorohydrin	10.9	Isopropylbenzene	8.75	Napthalene	8.12
Ethylene Oxide	10.57	Isovaleraldehyde	9.71	n-Butanal	9.83
Ethyne	11.41	Ketene	9.61	n-Butane	10.63
Fluorobenzene	9.2	m-bromotoluene	8.81	n-Butanol	10.04
Fluorobromomethane	11.77	m-chlorotoluene	8.86	n-butyl acetate	10.01
Fluoroethane	12	m-cresol	8.48	n-butyl alcohol	10.04
Fluoroethene	10.37	m-dichlorobenzene	9.12	n-butyl Mercaptan	9.15
Fluorotribromomethane	10.67	Mesityl Oxide	9.08	n-butylamine	8.71
Formaldehyde	10.87	Mesitylene	8.4	n-butylbenzene	8.69
Formamide	10.25	Methanol	10.85	n-butyraldehyde	9.86
Formic Acid	10.37	Methyl Ethyl Sulfide	8.55	n-Heptane	9.9
Freon 11 (CFCl3)	11.77	Methyl Styrene	8.35	n-Hexane	10.18
Freon 113 (CF3CCl3)	11.78	Methyl Acetate	10.27	Nitric Oxide	9.27
Freon 114	12	Methyl Acrylate	10.72	Nitrobenzene	9.92
Freon 21	12	Methyl Amine	8.97	Nitroethane	9.92
Furan	8.89	Methyl Bromide	10.54	Nitromethane	11.08



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Nitrotoluene	10.88	p-iodotoluene	8.5	Triethylamine	7.5
Nonane	10.21	p-nitrochlorobenzene	9.96	Trifluoroethene	10.14
n-pentanal	9.82	Propadiene	10.19	Trifluoroiodomethane	10.4
n-Pentane	10.34	Propane	11.07	Trifluoromethylbenzene	9.68
n-perfluoropropyl Iodide	10.26	Propanol	10.51	Trifluoromethylcyclohexane	10.46
n-Perfuoropropyl-Iodomethane	9.96	Propanone	11.07	Trimethylamine	7.82
n-Perfuoropropyl-Methyl Ketone	10.58	Propenal (Acrolein)	10.1	Vinyl Acetate	9.19
n-propanal	9.95	Propene	9.73	Vinyl Benzene (Styrene)	8.47
n-Propanol	10.51	Propene Nitrile	10.9	Vinyl Bromide	9.8
n-propyl acetate	10.04	Propionaldehyde	9.98	Vinyl Chloride (Chloroethylene)	10
n-Propyl Alcohol	10.15	Propionic Acid	10.34	Vinyl Cyanide	10.9
n-propyl amine	8.78	Propionitrile	11.84	Vinyl Ethanoate	9.19
n-propyl benzene	8.72	Propylene	9.73	Vinyl Fluoride	10.37
n-propyl ether	9.27	Propylene imine	8.76	Vinyl Methyl Ether	8.93
n-propyl formate	10.54	Propylene oxide	10.22		
n-Propylamine	8.78	Propyne	10.36		
n-Propylbenzene	8.72	p-tert-butyltoluene	8.35		
n-valderaldehyde	9.82	p-xylene	8.45		
o-bromotoluene	8.78	Pyridine	9.32		
o-chloriodobenzene	8.35	s-Butanal	9.73		
o-chlorotoluene	8.83	s-Butanol	10.23		
o-cresol	8.48	s-Butyl Acetate	9.91		
Octane	10.24	s-Butylamine	8.7		
o-dichlorobenzene	9.07	Styrene	8.4		
o-difluorobenzene	9.31	t-Butanol	10.25		
o-fluorotoluene	8.91	t-butyl acetate	9.9		
o-iodotoluene	8.62	t-Butyl Mercaptan	9.03		
o-toluidine	7.44	t-butylamine	8.64		
o-vinyl Toluene	8.2	t-Butylbenzene	8.68		
o-xylene	8.56	tert-butanol	10.25		
p-bromotoluene	8.67	tert-butyl mercaptan	9.03		
p-chlorotoluene	8.7	tert-butylamine	8.64		
p-cresol	8.97	tert-butylbenzene	8.68		
p-dichlorobenzene	8.94	Tetrahydropyran	9.26		
p-difluorobenzene	9.15	Tetrachloroethylene (PCE)	9.32		
p-dioxane	9.13	Tetrachloromethane	11.47		
Pentachloroethane	11.28	Tetrafluoroethene	10.12		
Pentafluorobenzene	9.84	Tetrahydrofuran	9.45		
Pentamethylbenzene	7.92	Thioethanol	9.29		
Pentane	10.34	Thiomethanol	9.44		
Perchloroethylene	9.32	Thiophene	8.86		
Perfluoro-1-heptene	10.48	Toluene	8.82		
Perfluoro-2-butene	11.25	trans-1,2-dichloroethene	9.66		
Perfuoro-1-Heptene	10.48	trans-1,3-Pentadiene	8.56		
p-Fluorotoluene	8.79	trans-1-chloro-2-fluoroethene	9.87		
p-fluorotoluene	9.79	trans-2-butene	9.13		
Phenol	8.5	trans-dichloroethane	9.65		
Phenyl Ether	8.09	Tribromoethene	9.27		
Phenyl Isocyanete	8.77	Tribromomethane	10.51		
Phosgene	11.77	Trichloroethylene (TCE)	9.45		
Phosphine	10.1	Trichloromethane	11.42		
Pinene	8.07	Trichloromethyl ethyl ether	10.08		

