

piD-TECH® eVx® & eV-NXT® PHOTOIONIZATION SENSOR IONIZATION POTENTIALS & RESPONSE FACTORS

This document is a general guideline for ionization potentials and response factors—also known as correction factors—for use with the MOCON® BASELINE® piD-TECH eVx and eV-NXT photoionization detector (PID), sensors and instruments. The response factor may vary depending on instrument and operation conditions. For the best accuracy, AMETEK MOCON recommends calibrating the instrument to a target gas. Actual readings may vary with age and cleanliness of lamp, relative humidity, and other factors. For accurate work, the instrument should be calibrated regularly under the operating conditions used.

All response factors based upon an isobutylene calibration.



piD-TECH Photoionization Sensor

IONIZATION POTENTIALS & RESPONSE FACTORS

Analyte	Ionization Potential (eV)	Factor Response (RF)
A		
2-Aminopyridine	8.00	
Acetaldehyde	10.21	10.80
Acetamide	9.77	
Acetic Acid	10.69	11.00
Acetic Anhydride	10.00	
Acetone	9.69	1.2
Acetonitrile	12.20	
Acetophenone	9.27	0.59
Acetyl Bromide	10.55	
Acetyl Chloride	11.02	
Acetylene	11.41	
Acrolein	10.10	3.9
Acrylamide	9.50	
Acrylonitrile	10.91	
Allyl Alcohol	9.67	2.5
Allyl Chloride	9.90	
Ammonia	10.20	9.4
Aniline	7.70	
Anisidine	7.44	
Anisole	8.22	
Arsine	9.89	2.6
B		
1,3-Butadiene (butadiene)	9.07	
1-Bromo-2-chloroethane	10.63	
1-Bromo-2-methylpropane	10.09	
1-Bromo-4-fluorobenzene	8.99	
1-Bromobutane	10.13	
1-Bromopentane	10.10	
1-Bromopropane	10.18	
1-Bromopropene	9.30	
1-Butanethiol	9.14	
1-Butene	9.58	
1-Butyne	10.18	
2,3-Butadione	9.23	
2-Bromo-2-methylpropane	9.89	
2-Bromobutane	9.98	
2-Bromopropane	10.08	
2-Bromothiophene	8.63	
3-Butanone (MEK)	9.54	
3-Bromopropene	9.70	
3-Butene Nitrile	10.39	

Analyte	Ionization Potential (eV)	Factor Response (RF)
Benzaldehyde	9.53	
Benzene	9.25	0.53
Benzenethiol	8.33	
Benzonitrile	9.71	
Benzo-trifluoride	9.68	
Biphenyl	8.27	
Boron Oxide	13.50	
Boron Trifluoride	15.56	
Bromine	10.54	
Bromobenzene	8.98	
Bromochloromethane	10.77	
Bromoform	10.48	2.3
Butane	10.63	
Butyl Mercaptan	9.15	
cis-2-Butene	9.13	
m-Bromotoluene	8.81	
n-Butyl Acetate	10.01	2.4
n-Butyl Alcohol	10.04	
n-Butyl Amine	8.71	
n-Butyl Benzene	8.69	
n-Butyl Formate	10.50	
n-Butyraldehyde	9.86	
n-Butyric Acid	10.16	
n-Butyronitrile	11.67	
o-Bromotoluene	8.79	
p-Bromotoluene	8.67	
p-tert-Butyltoluene	8.28	
s-Butyl Amine	8.70	
s-Butyl Benzene	8.68	
sec-Butyl Acetate	9.91	
t-Butyl Amine	8.64	
t-Butyl Benzene	8.68	
trans-2-Butene	9.13	
C		
1-Chloro-2-methylpropane	10.66	
1-Chloro-3-fluorobenzene	9.21	
1-Chlorobutane	10.67	
1-Chloropropane	10.82	
2-Chloro-2-methylpropane	10.61	
2-Chlorobutane	10.65	
2-Chloropropane	10.78	
2-Chlorothiophene	8.68	

Analyte	Ionization Potential (eV)	Factor Response (RF)
3-Chloropropene	10.04	
Camphor	8.76	
Carbon Dioxide	13.79	
Carbon Disulfide	10.07	1.2
Carbon Monoxide	14.01	
Carbon Tetrachloride	11.47	
Chlorine	11.48	
Chlorine Dioxide	10.36	
Chlorine Trifluoride	10.36	
Chloroacetaldehyde	10.36	
a-Chloroacetophenone	9.44	
Chlorobenzene	9.07	0.4
Chlorobromomethane	10.77	
Chlorofluoromethane (Freon® 22)	12.45	
Chloroform	11.37	
Chlorotrifluoromethane (Freon® 13)	12.91	
Chrysene	7.59	
Cresol	8.14	
Crotonaldehyde	9.73	
Cumene (isopropyl benzene)	8.75	0.54
Cyanogen	13.80	
Cyclohexane	9.80	1.5
Cyclohexanol	9.75	
Cyclohexanone	9.14	0.82
Cyclohexene	8.95	
Cyclooctatetraene	7.99	
Cyclopentadiene	8.56	
Cyclopentane	10.53	
Cyclopentanone	9.26	
Cyclopentene	9.01	
Cyclopropane	10.06	
m-Chlorotoluene	8.83	
o-Chlorotoluene	8.83	
p-Chlorotoluene	8.70	
D		
1,1-Dibromoethane	10.19	
1,1-Dichloroethane	11.12	
1,1-Dimethoxyethane	9.65	
1,1-Dimethylhydrazine	7.28	
1,2-Dibromoethene	9.45	11.7
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon® 114)	12.20	

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D		
1,2-Dichloroethane	11.12	0.5
1,2-Dichloropropane	10.87	
1,3-Dibromopropane	10.07	
1,3-Dichloropropane	10..85	
2,2-Dimethylpropane	10.06	
2,2-Dimethylpropane	10.35	
2,2,3-Dichloropropene	9.82	
2,3-Dimethyl Butane	10.02	
3,3-Dimethyl Butanone	9.17	
cis-Dichloroethene	9.65	
Decaborane	9.88	
Diazomethane	9.00	
Diborane	12.00	
Dibromochloromethane	10.59	
Dibromodifluoromethane	11.07	
Dibromomethane	10.49	
Dibutylamine	7.69	
Dichlorodifluoromethane (Freon® 12)	12.31	
Dichlorofluoromethane	12.39	
Dichloromethane	11.35	
Diethoxymethane	9.70	
Diethylamine	8.01	
Diethyl Ether (Ethyl Ether, Ether)	9.53	
Diethyl Ketone	9.32	
Diethyl Sulfide	8.43	
Diethyl Sulfite	9.68	
Difluorodibromomethane	11.07	
Dihydropyran	8.34	
Diiodomethane	9.34	
Diisopropylamine	7.73	
Dimethoxymethane (Methylal)	10.00	11.3
Dimethylamine	8.24	
Dimethyl Ether	10.00	
Dimethyl Sulfide	8.69	
Dimethylaniline	7.13	
Dimethylformamide	9.18	
Dimethylphthalate	9.64	
Dinitrobenzene	10.71	
Dioxane	9.19	
Diphenyl	7.95	
Diphenyl Oxide (Phenyl ether)	8.82	
Dipropylamine	7.84	
Dipropyl Sulfide	8.30	
Durene	8.03	
m-Dichlorobenzene	9.12	
N,N-Diethylacetamide	8.60	
N,N-Diethylformamide 1	8.89	
N,N-Dimethylacetamide	8.81	
N,N-Dimethylformamide	9.12	
o-Dichlorobenzene	9.06	
p-Dichlorobenzene	8.95	

Analyte	Ionization Potential (eV)	Factor Response (RF)
p-Dioxane	9.13	
trans-Dichloroethene	9.66	
E		
Epichlorohydrin	10.20	7.6
Ethane	11.65	
Ethanethiol (Ethylmercaptan)	9.29	0.6
Ethanolamine	8.96	
Ethene	10.52	
Ethyl Acetate	10.11	4.2
Ethyl Alcohol	10.48	
Ethylamine	8.86	
Ethylbenzene	8.76	0.51
Ethyl Bromide	10.29	
Ethyl Chloride (Chloroethane)	10.98	
Ethyl Disulfide	8.27	
Ethylene	10.50	10.1
Ethyl Ether (Diethyl Ether, Ether)	9.53	1.2
Ethyl Formate	10.61	
Ethyl Iodide	9.33	
Ethyl Isothiocyanate	9.14	
Ethyl Mercaptan	9.29	0.6
Ethyl Methyl Sulfide	8.55	
Ethyl Nitrate	11.22	
Ethyl Propionate	10.00	
Ethyl Thiocyanate	9.89	
Ethylene Chlorohydrin	10.52	
Ethylenediamine (EDA)	8.60	
Ethylene Dibromide	10.37	
Ethylene Dichloride	11.05	
Ethylene Oxide	10.57	19.5
Ethylenimine	9.20	
Ethynylbenzene	8.82	
F		
2-Furaldehyde	9.21	
Fluorine	15.70	
Fluorobenzene	9.20	
Formaldehyde	10.87	
Formamide	10.25	
Formic Acid	11.05	
Freon® 11 (Trichlorofluoro - methane)	11.77	
Freon® 112 (1,1,2,2-Tetra- chloro-1,2-difluoroethane)	11.30	
Freon® 113 (1,1,2-Tri 1,2,2-trifluoroethane)	11.78	
Freon® 114 (1,2-Dichloro-1,1,2,2-tetrafluoroethane)	12.20	
Freon® 12 (Dichloro- difluoromethane)	12.31	
Freon® 13 (Chlorotrifluoromethane)	12.91	
Freon® 22 (Chlorofluoro-methane)	12.45	
Furan	8.89	
Furfural	9.21	
m-Fluorotoluene	8.92	
o-Fluorophenol	8.66	
o-Fluorotoluene	8.92	
p-Fluorotoluene	8.79	

Analyte	Ionization Potential (eV)	Factor Response (RF)
H		
1-Hexene	9.46	
2-Heptanone	9.33	
2-Hexanone	9.35	
Heptane	10.08	2.5
Hexachloroethane	11.10	
Hydrazine	8.10	2.6
Hydrogen	15.43	
Hydrogen Bromide	11.62	
Hydrogen Chloride	12.74	
Hydrogen Cyanide	13.91	
Hydrogen Fluoride	15.77	
Hydrogen Iodide	10.38	
Hydrogen Selenide	9.88	
Hydrogen Sulfide	10.46	3.2
Hydrogen Telluride	9.14	
Hydroquinone	7.95	
I		
1-Iodo-2-methylpropane	9.18	
1-Iodobutane	9.21	
1-Iodopentane	9.19	
1-Iodopropane	9.26	
2-Iodobutane	9.09	
2-Iodopropane	9.17	
Iodine	9.28	
Iodobenzene	8.73	
Isobutane (Isobutylene)	9.40	
Isobutyl Acetate	9.97	2.6
Isobutyl Alcohol	10.12	
Isobutyl Amine	8.70	
Isobutyl Formate	10.46	
Isobutyraldehyde	9.74	
Isobutyric Acid	10.02	
Isopentane	10.32	8.0
Isophorone	9.07	0.74
Isoprene (2-Methyl-1,3-butadiene)	8.85	0.6
Isopropyl Acetate	9.99	2.6
Isopropyl Alcohol	10.16	
Isopropyl Amine	8.72	
Isopropyl Benzene	8.69	
Isopropyl Ether	9.20	0.8
Isovaleraldehyde	9.71	
m-Iodotoluene	8.61	
o-Iodotoluene	8.62	
p-Iodotoluene	8.50	
K		
Ketene	9.61	
L		
2,3-Lutidine	9.61	
2,4-Lutidine	9.61	
2,6-Lutidine	9.61	

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Analyte	Ionization Potential (eV)	Factor Response (RF)
M		
2-Methylfuran	8.39	
2-Methylnaphthalene	7.96	
1-Methylnaphthalene	7.96	
2-Methylpropene	9.23	
2-Methyl-1-butene	9.12	
2-Methylpentane	10.12	
3-Methyl-1-butene	9.51	
3-Methyl-2-butene	8.67	
3-Methylpentane	10.08	
4-Methylcyclohexene	8.91	
Maleic Anhydride	10.80	
Mesityl Oxide	9.08	0.47
Mesitylene	8.40	
Methane	12.98	
Methanethiol (Methyl Mercaptan)	9.44	
Methyl Acetate	10.27	7.0
Methyl Acetylene	10.37	
Methyl Acrylate	9.90	3.4
Methyl Alcohol	10.85	
Methyl Amine	8.97	
Methyl Bromide	10.54	
Methyl Butyl Ketone	9.34	
Methyl Butyrate	10.07	
Methyl Cellosolve	9.60	
Methyl Chloride	11.28	
Methyl Chloroform (1,1,1-Trichloroethane)	11.00	
Methyl Disulfide	8.46	
Methyl Ethyl Ketone (MEK)	9.53	0.9
Methyl Formate	10.82	
Methyl Iodide	9.54	
Methyl Isobutyl Ketone	9.30	1.1
Methyl Isobutyrate	9.98	
Methyl Isocyanate	10.67	
Methyl Isopropyl Ketone	9.32	
Methyl Isothiocyanate	9.25	
Methyl Mercaptan (Methanethiol)	9.44	0.6
Methyl Methacrylate	10.15	1.5
Methyl Propyl Ketone	9.39	
a-Methyl Styrene	8.35	
Methyl Thiocyanate	10.07	
Methylal (Dimethoxymethane)	10.00	
Methylcyclohexane	9.85	
Methylene Chloride	11.32	
Methyl (n-amyl) Ketone	9.30	
Monomethyl Aniline	7.32	
Monomethyl Hydrazine	7.67	
Morpholine	8.20	
N-Methylacetamide	8.90	
N		
1-Nitropropane	10.88	
2-Nitropropane	10.71	

Analyte	Ionization Potential (eV)	Factor Response (RF)
Naphthalene	8.12	0.37
Nickel Carbonyl	8.27	
Nitric oxide (NO)	9.25	7.2
Nitrobenzene	9.92	
Nitroethane	10.88	
Nitrogen	15.58	
Nitrogen Dioxide	9.78	10.00
Nitrogen Trifluoride	12.97	
Nitromethane	11.08	
Nitrotoluene	9.45	
p-Nitrochlorobenzene	9.96	
O		
Octane	9.82	
Oxygen	12.08	
Ozone	12.08	
P		
1-Pentene	9.50	
1-Propanethiol	9.20	
2,4-Pentanedione	8.87	
2-Pentanone	9.38	0.78
2-Picoline	9.02	0.57
3-Picoline	9.02	0.9
4-Picoline	9.04	
n-Propyl Nitrate	11.07	
Pentaborane	10.40	
Pentane	10.35	
Perchloroethylene	9.32	
Phenoloic	8.18	
Phenol	8.50	1.0
Phenyl Ether (Diphenyl Oxide)	8.82	
Phenyl Hydrazine	7.64	
Phenyl Isocyanate	8.77	
Phenyl Isothiocyanate	8.52	
Phenylene Diamine	6.89	
Phosgene	11.77	
Phosphine	9.87	2.8
Phosphorus Trichloride	9.91	
Phthalic Anhydride	10.00	
Propane	11.07	
Propargyl Alcohol	10.51	
Propiolactone	9.70	
Propionaldehyde (Propanal)	9.98	14.8
Propionic Acid	10.24	
Propionitrile	10.04	
Propyl Alcohol	10.20	
Propyl Amine	8.78	
Propyl Benzene	8.72	
Propyl Ether	9.27	
Propyl Formate	10.54	
Propylene	9.73	1.3
Propylene Dichloride	10.87	
Propyleneimine	9.00	

Analyte	Ionization Potential (eV)	Factor Response (RF)
Propylene Oxide	10.22	6.5
Propyne	10.36	
Pyridine	9.32	0.79
Pyrrrole	8.20	
Q		
Quinone	10.04	
S		
Stibine	9.51	
Styrene	8.47	0.4
Sulfur Dioxide	12.30	
Sulfur Hexafluoride	15.33	
Sulfur Monochloride	9.66	
Sulfuryl Fluoride	13.00	
T		
o-Terphenyls	10.46	
1,1,2,2-Tetrachloro-1,2-difluoroethane (Freon® 112)	9.14	
1,1,1-Trichloroethane (Methyl Chloroform)	7.95	
1,1,2-Trichloro-1,2,2-tri-fluoroethane (Freon® 113)	11.78	
2,2,4-Trimethyl Pentane	9.86	
o-Toluidine	7.44	
Tetrachloromethane	11.47	
Tetrahydrofuran	9.54	1.6
Tetrahydropyran	9.25	
Thiolacetic Acid	10.00	
Thiophene	8.86	0.47
Toluene	8.82	0.53
Tribromoethene	9.27	
V		
o-Vinyl Toluene	8.20	
Valeraldehyde	9.82	
Valeric Acid	10.12	
Vinyl Acetate	9.19	1.3
Vinyl Bromide	9.80	0.4
Vinyl Chloride	10.00	
Vinyl Methyl Ether	8.93	
W		
Water	12.59	
X		
2,4-Xylidine	7.65	
m-Xylene	8.56	0.53
o-Xylene	8.56	0.54
p-Xylene	8.45	0.50

