

Appendix I

PID Correction Factors

for Various Gases and Lamps with Instrument Calibrated to Isobutylene

Compound Name	Formula	9.8	C	10.6	C	11.7	C	IP (eV)
Acetaldehyde	C ₂ H ₄ O			5.5	+			10.23
Acetic Acid	C ₂ H ₄ O ₂	NR	+	22	+	2.6	+	10.66
Acetic Anhydride	C ₄ H ₆ O ₃	NR	+	6.1	+	2.0	+	10.14
Acetone	C ₃ H ₆ O	1.2	+	1.1	+	1.4	+	9.71
Acetonitrile	C ₂ H ₃ N					100		12.19
Acetylene	C ₂ H ₂					2		11.40
Acrolein	C ₃ H ₄ O	42	+	3.9	+	1.4	+	10.10
Acrylic Acid	C ₃ H ₄ O ₂			12	+	2.0	+	10.60
Acrylonitrile	C ₃ H ₃ N			NR	+	1.2	+	10.91
Allyl alcohol	C ₃ H ₆ O			2.4	+	1.7		9.67
Allyl chloride	C ₃ H ₅ Cl			4.3		0.7		9.9
Ammonia	H ₃ N	NR	+	9.7	+	5.7	+	10.16
Amyl alcohol	C ₅ H ₁₂ O			5				10.00
Aniline	C ₇ H ₇ N	0.50	+	0.5	+	0.5	+	7.72
Anisole	C ₇ H ₈ O			0.8				8.21
Benzaldehyde	C ₇ H ₆ O					1		9.49
Benzene	C ₆ H ₆	0.55	+	0.5	+	0.6	+	9.25
Benzonitrile	C ₇ H ₅ N			1.6				9.62
Benzyl chloride	C ₇ H ₇ Cl			2		0.7		
Bromobenzene	C ₆ H ₅ Br			0.6		0.5		8.98
Bromoform	CHBr ₃	NR	+	2.5	+	0.5	+	10.48
Bromopropane, 1-	C ₃ H ₇ Br	150	+	1.5	+	0.6	+	10.18
Butadiene	C ₄ H ₆			1.0	+	1.1		9.07
Butadiene diepoxide, 1,3-	C ₄ H ₆ O ₂	25	+	3.5	+	1.2		~10
Butane	C ₄ H ₁₀					1.2		10.53
Butanol, 1-	C ₄ H ₁₀ O	70	+	4.7	+	1.4	+	9.99
Butene, 1-	C ₄ H ₈			0.9				9.58
Butoxyethanol, 2-	C ₆ H ₁₄ O ₂	1.8	+	1.2	+	0.6	+	<10

Notes:

1. The values indicated by a plus (+) sign in the "C" column are confirmed values; all others are preliminary and subject to change.
2. The correction factors in this table were measured in dry air. Actual readings may vary with age and cleanliness of the lamp, relative humidity, components in the sample, and other factors. For accurate work, the instrument should be calibrated regularly under the operational conditions in which the instrument is used.
3. IP (eV) data was taken from the *CRC Handbook of Chemistry and Physics*, 73rd Edition, and *NIST Standard Ref. Database 19A*.

(Courtesy of RAE Systems, Inc.)

Compound Name	Formula	9.8	C	10.6	C	11.7	C	IP (eV)
Butyl acetate, n-	C ₆ H ₁₂ O ₂			2.6	+			10
Butyl acrylate, n-	C ₇ H ₁₂ O ₂			1.6	+	0.6	+	
Butylamine	C ₄ H ₁₁ N			7				8.71
Butyl mercaptan	C ₄ H ₁₀ S			0.5				9.14
Carbon disulfide	CS ₂			1.2	+	0.3		10.07
Carbon tetrachloride	CCl ₄	NR	+	NR	+	1.7	+	11.47
Chlorine	Cl ₂					1.0	+	11.48
Chloro-1,3-butadiene, 2-	C ₄ H ₅ Cl			3				
Chlorobenzene	C ₆ H ₅ Cl	0.44	+	0.40	+	0.39	+	9.06
Chloro-1,1-difluoroethane, 1- (R-142B)	C ₂ H ₃ ClF ₂			NR		NR		12.0
Chlorodifluoromethane	CHClF ₂	NR		NR		NR		12.2
Chloroethane	C ₂ H ₅ Cl	NR	+	NR	+	1.1	+	10.97
Chloroethanol	C ₂ H ₅ ClO							10.52
Chloroethyl methyl ether, 2-	C ₃ H ₇ ClO			3				
Chloroform	CHCl ₃	NR	+	NR	+	3.5	+	11.37
Chlorotoluene, o-	C ₇ H ₇ Cl			0.5		0.6		8.83
Chlorotoluene, p-	C ₇ H ₇ Cl					0.6		8.69
Crotonaldehyde	C ₄ H ₆ O	1.5	+	1.1	+	1.0	+	9.73
Cumene	C ₉ H ₁₂	0.58	+	0.5	+	0.4	+	8.73
Cyanogen bromide	CNBr	NR		NR		NR		11.84
Cyanogen chloride	CNCl	NR		NR		NR		12.34
Cyclohexane	C ₆ H ₁₂			1.4	+			9.86
Cyclohexanol	C ₆ H ₁₂ O					1.1		9.75
Cyclohexanone	C ₆ H ₁₀ O	1.0	+	0.9	+	0.7	+	9.14
Cyclohexene	C ₆ H ₁₀			0.8	+			8.95
Cyclohexylamine	C ₆ H ₁₃ N			1.2				8.62
Cyclopentane	C ₅ H ₁₀					0.6		10.51
Decane	C ₁₀ H ₂₂	4.0	+	1.4	+	0.4	+	9.65
Diacetone alcohol	C ₆ H ₁₂ O ₂			0.7				
Dibromoethane, 1,2-	C ₂ H ₄ Br ₂	NR	+	1.7	+	0.6	+	10.37
Dichlorobenzene, o	C ₆ H ₄ Cl ₂	0.54	+	0.47	+	0.38	+	9.08

Compound Name	Formula	9.8	C	10.6	C	11.7	C	IP (eV)
Dichlorodifluoromethane	CCl ₂ F ₂			NR	+	NR	+	11.75
Dichloroethane, 1,1-	C ₂ H ₄ Cl ₂							11.06
Dichloroethane, 1,2-	C ₂ H ₄ Cl ₂			NR	+	0.6	+	11.04
Dichloroethene, 1,1-	C ₂ H ₂ Cl ₂			0.9				9.79
Dichloroethene, c-1,2-	C ₂ H ₂ Cl ₂			0.8				9.66
Dichloroethene, t-1,2-	C ₂ H ₂ Cl ₂			0.5	+	0.3	+	9.65
Dichloro-1-fluoroethane, 1,1- (R-141B)	C ₂ H ₃ Cl ₂ F	NR	+	NR	+	2.0	+	
Dichloropropane, 1,2	C ₃ H ₆ Cl ₂					0.7		10.87
Dichloro-1-propene, 2,3-	C ₃ H ₄ Cl ₂	1.9	+	1.3	+	0.7	+	<10
Dichloro-1,1,1-trifluoro- ethane, 2,2- (R-123)	C ₂ HCl ₂ F ₃	NR	+	NR	+	10.1	+	11.5
Diesel Fuel #1	m.w. 226			0.9	+			
Diesel Fuel #2	m.w. 216			0.7	+	0.4	+	
Diethylamine	C ₄ H ₁₁ N			1	+			8.01
Diethylaminopropylamine, 3-	C ₇ H ₁₈ N ₂			1.3				
Diethylmaleate	C ₈ H ₁₂ O ₄			4				
Dimethylacetamide, N,N-	C ₄ H ₉ NO	0.87	+	0.8	+	0.8	+	8.81
Dimethylamine	C ₂ H ₇ N			1.5				8.23
Dimethyl disulfide	C ₂ H ₆ S ₂	0.2	+	0.20	+	0.2	+	7.4
Dimethylformamide, N,N-	C ₃ H ₇ NO			0.8				9.13
Dimethylhydrazine, 1,1-	C ₂ H ₈ N ₂			0.8	+	0.8	+	7.28
Dimethyl sulfate	C ₂ H ₆ O ₄ S	~23		~20	+	2.3	+	
Dioxane, 1,4-	C ₄ H ₈ O ₂			1.1				9.19
Epichlorohydrin	C ₂ H ₅ ClO	~200	+	8.5	+	1.4	+	10.2
Ethane	C ₂ H ₆			NR	+	15	+	11.52
Ethanol	C ₂ H ₆ O			12	+	8		10.47
Ethanolamine (Not Recommended)	C ₂ H ₇ NO			~4	+	~3	+	8.96
Ethene	C ₂ H ₄			10	+	3		10.51
Ethoxyethanol, 2-	C ₄ H ₁₀ O ₂			3.5				9.6
Ethyl acetate	C ₄ H ₈ O ₂			4.6	+			10.01

Compound Name	Formula	9.8	C	10.6	C	11.7	C	IP (eV)
Ethyl acrylate	C ₅ H ₈ O ₂			2.4	+	1.0	+	(<10.3)
Ethylamine	C ₂ H ₇ N			0.8				8.86
Ethylbenzene	C ₈ H ₁₀	0.52	+	0.5	+	0.5	+	8.77
Ethylene glycol	C ₂ H ₆ O ₂			16	+	6	+	10.16
Ethylene oxide	C ₂ H ₄ O			19	+	3	+	10.57
Ethyl ether	C ₄ H ₁₀ O			1.1	+			9.51
Ethyl formate	C ₃ H ₆ O ₂					1.9		10.61
Ethyl hexyl acrylate, 2-	C ₁₁ H ₂₀ O ₂			1.1	+	0.5	+	
Ethyl (S)-(-)-lactate	C ₅ H ₁₀ O ₃	13	+	3.2	+	1.6	+	~10
Ethyl mercaptan	C ₂ H ₆ S			0.6				9.29
Ethyl sulfide	C ₄ H ₁₀ S			0.5	+			8.43
Formaldehyde	CH ₂ O					0.6		10.87
Furfural	C ₅ H ₄ O ₂			0.9	+	0.8	+	9.21
Gasoline #1	m.w. 72			0.9	+			
Gasoline #2, 92 octane	m.w. 93	1.3	+	1.0	+	0.5	+	
Glutaraldehyde	C ₅ H ₈ O ₂	1.1	+	0.8	+	0.6	+	
Halothane	C ₂ HBrClF ₃					0.6		11.0
HCFC-123 (see 2,2-Dichloro-1,1,1-trifluoroethane, R-123)								
HCFC-141B (see 1,1-Dichloro-1-fluoroethane)								
HCFC-142B (see 1-Chloro-1,1-difluoroethane)								
Heptane, n-	C ₇ H ₁₆			2.6	+	0.5		9.92
Hexamethyldisilazane, 1,1, 1,3,3,3- HMDS	C ₆ H ₁₉ NSi ₂			0.2	+	0.2	+	~8.6
Hexane, n	C ₆ H ₁₄	300		4.3	+	0.5	+	10.13
Hexene, 1-	C ₆ H ₁₂	0.8		9.44				
Hydrazine	H ₄ N ₂			2.6	+	2.1	+	8.1
Hydrogen	H ₂	NR	+	NR	+	NR	+	15.43
Hydrogen peroxide	H ₂ O ₂	NR	+	NR	+	NR	+	10.54
Hydrogen sulfide	H ₂ S	NR	+	3.3	+	1.5	+	10.45
Iodine	I ₂	0.1	+	0.1	+	0.1	+	9.40
Isobutane	C ₄ H ₁₀			100	+	1.2	+	10.57
Isobutanol	C ₄ H ₁₀ O	19	+	3.8	+	1.5		10.02

Compound Name	Formula	9.8	C	10.6	C	11.7	C	IP (eV)
Isobutene	C ₄ H ₈	1.00	+	1.00	+	1.00	+	9.24
Isobutyl acrylate	C ₇ H ₁₂ O ₂			1.5	+	0.60	+	
Isoflurane	C ₃ H ₂ ClF ₅ O							
Isooctane	C ₈ H ₁₈			1.4				9.86
Isopar G Solvent	m.w. 148			0.8	+			
Isopar M Solvent	m.w. 191			0.7	+	0.4	+	
Isophorone	C ₉ H ₁₄ O					3		9.07
Isoprene	C ₅ H ₈	0.69	+	0.6	+	0.60	+	8.85
Isopropanol	C ₃ H ₈ O	500	+	6.0	+	2.7		10.12
Isopropyl acetate	C ₅ H ₁₀ O ₂			2.5				9.99
Isopropyl ether	C ₆ H ₁₄ O			0.8				9.20
Jet fuel JP-4	m.w. 115			1	+	0.4	+	
Jet fuel JP-5	m.w. 167			0.6	+	0.5	+	
Jet fuel JP-8	m.w. 165			0.6	+	0.3	+	
Kerosene (C10-C16 petro.distillate - see Jet Fuels)								
Mesitylene	C ₉ H ₁₂	0.36	+	0.35	+	0.3	+	8.41
Methane	CH ₄	NR	+	NR	+	NR	+	12.51
Methanol	CH ₄ O	NR	+	NR	+	2.5	+	10.85
Methoxyethanol, 2-	C ₃ H ₈ O ₂	4.8	+	2.4	+	1.4	+	10.1
Methoxyethoxyethanol, 2-	C ₇ H ₁₆ O ₃	2.3	+	1.2	+	0.9	+	<10
Methyl acetate	C ₃ H ₆ O ₂					1.6		10.27
Methyl acrylate	C ₄ H ₆ O ₂			3.7	+	1.2	+	(9.9)
Methylamine	CH ₅ N			1.0				8.97
Methyl bromide	CH ₃ Br	110	+	1.7	+	1.3	+	10.54
Methyl t-butyl ether	C ₅ H ₁₂ O			0.9	+			9.24
Methyl cellosolve (see 2-Methoxyethanol)								
Methyl chloride	CH ₃ Cl	NR	+	NR	+	0.7	+	11.22
Methylcyclohexane	C ₇ H ₁₄			1.1				9.64
Methylene chloride	CH ₂ Cl ₂	NR	+	NR	+	0.89	+	11.32
Methyl ethyl ketone	C ₄ H ₈ O	0.86	+	0.9	+	1.1	+	9.51
Methylhydrazine	C ₂ H ₆ N ₂	1.4	+	1.2	+	1.3	+	7.7
Methyl isobutyl ketone	C ₆ H ₁₂ O			1.2	+	0.9		9.30

Compound Name	Formula	9.8	C	10.6	C	11.7	C	IP (eV)
Methyl isocyanate	C ₂ H ₃ NO	NR	+	4.6	+	1.5		10.67
Methyl mercaptan	CH ₄ S			0.6				9.44
Methyl methacrylate	C ₅ H ₈ O ₂			1.4	+	1.4		9.7
Methyl propyl ketone	C ₅ H ₁₂ O			0.9	+	0.8	+	9.38
Methyl-2-pyrrolidinone, N-	C ₅ H ₉ NO	1.0	+	0.8	+	0.9	+	9.17
Methyl salicylate	C ₈ H ₈ O ₃			2				
Methylstyrene, α-	C ₉ H ₁₀			0.5				8.18
Mineral spirits (Stoddard Solvent, see also Viscor 120B)				0.7	+	0.39	+	
Mineral Spirits Viscor 120B Calibration Fluid		1.0	+	0.7	+	0.3	+	
Naphthalene (Mothballs)	C ₁₀ H ₈	0.45	+	0.4	+	0.40	+	8.13
Nitric oxide	NO			5.2	+	2.8	+	9.26
Nitrobenzene	C ₆ H ₅ NO ₂	2.6	+	1.9	+	1.6	+	9.81
Nitroethane	C ₂ H ₅ NO ₂					3		10.88
Nitrogen dioxide	NO ₂			NR	+	NR	+	9.75
Nitromethane	CH ₃ NO ₂					4		11.02
Nitropropane, 2-	C ₃ H ₇ NO ₂					2.6		10.71
Nonane	C ₉ H ₂₀			2				9.72
Octane, n-	C ₈ H ₁₈	13.2	+	1.8	+			9.82
Pentane	C ₅ H ₁₂	80	+	8.4	+	0.7	+	10.35
Peracetic acid	C ₂ H ₄ O ₃	NR	+	NR	+	2.3	+	
Peracetic/Acetic acid mix	C ₂ H ₄ O ₃ /C ₂ H ₄ O ₂			50	+	2.5	+	
Perchloroethene	C ₂ Cl ₄	0.69	+	0.57	+	0.31	+	9.32
PGME	C ₆ H ₁₂ O ₃	2.4	+	1.5	+	1.1	+	
PGMEA	C ₆ H ₁₂ O ₃	1.65	+	1.0	+	0.8	+	
Phenol	C ₆ H ₆ O	1.0	+	1.0	+	0.9	+	8.51
Phosphine in N ₂	PH ₃			2	+	1.4		9.87
Photocopier Toner				0.5	+	0.3	+	
Picoline, 3-	C ₆ H ₇ N			0.9				9.04
Pinene, α-	C ₁₀ H ₁₆			0.3	+	0.5		8.07

Compound Name	Formula	9.8	C	10.6	C	11.7	C	IP (eV)
Pinene, b	C ₁₀ H ₁₆	0.38	+	0.4	+	0.4	+	~8
Piperylene, isomer mix	C ₅ H ₈	0.76	+	0.7	+	0.6	+	8.6
Propane	C ₃ H ₈			NR	+	1.8	+	10.95
Propanol, n-	C ₃ H ₈ O			6		1.7		10.22
Propene	C ₃ H ₆			1.7	+			9.73
Propionaldehyde	C ₃ H ₆ O			1.9				9.95
Propyl acetate, n-	C ₅ H ₁₀ O ₂			3.5				10.04
Propylene oxide	C ₃ H ₆ O			6.5		2		10.22
Propyleneimine	C ₃ H ₇ N	1.5	+	1.3	+	1.0	+	9.0
Pyridine	C ₅ H ₅ N	0.78	+	0.7	+	0.7	+	9.25
RR7300 (70:30 PGME/PGMEA)	C ₄ H ₁₀ O ₂ / C ₆ H ₁₂ O ₃	1.4	+	1.0	+			
Stoddard Solvent - see Mineral Spirits								
Styrene	C ₈ H ₈	0.45	+	0.40	+	0.4	+	8.43
Sulfur dioxide	SO ₂			NR	+	NR	+	12.32
Tetrachloroethane, 1,1,1,2-	C ₂ H ₂ Cl ₄					1.3		~11.1
Tetrachloroethane, 1,1,2,2-	C ₂ H ₂ Cl ₄	NR	+	NR	+	0.60	+	~11.1
Tetraethyllead	C ₈ H ₂₀ Pb	0.4		0.3		0.2		~11.1
Tetraethyl orthosilicate	C ₈ H ₂₀ O ₄ Si			0.7	+	0.2	+	~9.8
Tetrafluoroethane, 1,1,1,2-	C ₂ H ₂ F ₄			NR		NR		
Tetrafluoromethane	CF ₄			NR	+	NR	+	>15.3
Tetrahydrofuran	C ₄ H ₈ O	1.9	+	1.7	+	1.0	+	9.41
Therminol		0.90	+	0.7	+			
Toluene	C ₇ H ₈	0.54	+	0.50	+	0.51	+	8.82
Toluene-2,4-diisocyanate	C ₉ H ₆ N ₂ O ₂	1.4	+	1.4	+	2.0	+	
Trichloroethane, 1,1,1-	C ₂ H ₃ Cl ₃			NR	+	1	+	11
Trichloroethane, 1,1,2-	C ₂ H ₃ Cl ₃	NR	+	NR	+	0.9	+	11.0
Trichloroethene	C ₂ HCl ₃	0.62	+	0.5	+	0.4	+	9.47
Trichlorotrifluoroethane, 1,1,2- CFC-113	C ₂ Cl ₃ F ₃			NR		NR		11.99
Triethylamine	C ₆ H ₁₅ N			1.3				7.50
Trifluoroethane, 1,1,2-	C ₂ H ₃ F ₃					34		12.9

Compound Name	Formula	9.8	C	10.6	C	11.7	C	IP (eV)
Trimethylamine	C ₃ H ₉ N			0.9				7.82
Trimethylbenzene, 1,3,5- -	(see Mesitylene)							
Turpentine	C ₁₀ H ₁₆			0.4				
Undecane	C ₁₁ H ₂₄			2				9.56
Vinyl acetate	C ₄ H ₆ O ₂			1.2				9.19
Vinyl bromide	C ₂ H ₃ Br			0.4				9.80
Vinyl chloride in N ₂	C ₂ H ₃ Cl			2.0	+	0.6	+	9.99
Vinyl-2-pyrrolidinone, 1-	C ₆ H ₉ NO	1.0	+	0.8	+	0.9	+	
Viscor 120B - see Mineral Spirits - Viscor 120B Calibration Fluid								
Xylene, m-	C ₈ H ₁₀	0.50	+	0.4	+	0.40	+	8.56
Xylene, o-	C ₈ H ₁₀	0.57	+	0.6	+	0.7		8.56
Xylene, p-	C ₈ H ₁₀			0.5	+	0.6	+	8.44