**Appendix A.9** Henry's law constant and diffusion coefficients of contaminants in air and water for T = 0 to 25 °C (abstracted from Crawford, 1976 except where noted: [R]Reid et al., 1977; [P]Perry and Chilton, 1973; [S]Machay et al., 1981; [V]Vargaftik, 1975; [M]Mackay and Yeun, 1983).

| substance | Henry's law constant, $H'$ ($10^7$ N/m$^2$)* | air diffusion coefficient, $D_{j,air}$ ($10^{-5}$ m$^2$/s)* | water diffusion coefficient, $D_{j,water}$ ($10^{-9}$ m$^2$/s)* |
|---|---|---|---|
| acetic acid | | 1.06 | 1.19 |
| acetone | | 0.83 | 1.16 |
| acetonitrile | | | 1.26 |
| acetylene | 13.5 | 1.7 | 2.0 |
| ammonia | 0.03 | 2.2 | 2.0 |
| aniline | | 0.75 | 0.92 |
| benzene | 3.05[S] | 0.77 | 1.02 |
| benzoic acid | | | 1.00 |
| benzyl alcohol | | | 0.82 |
| biphenyl | 0.03[S] | | |
| bromine | 0.747 | 1.0 | 1.3 |
| n-butane | | 0.96[V] | 0.89 |
| n-butanol | | 0.89 | 0.77 |
| carbon dioxide | 16.5 | 1.5 | 2.0 |
| carbon monoxide | 587.0 | 2.0 | 2.0 |
| carbon disulfide | | 0.89[P] | |
| carbon tetrachloride | 11.1[5] | 0.62 | 0.82 |
| carbonyl sulfide | 26.3 | 1.3 | 1.5 |
| chloroform | 2.66[L] | 0.87 | 0.92 |
| chlorine | 6.82 | 1.2 | 1.5 |
| chlorobenzene | 2.0[5] | 0.62 | 0.86[M] |
| cyclohexane | 18.0[5] | 0.86[P] | |
| dibromochloropropane | 0.021 | 0.69 | 0.72 |
| diethylamine | | 0.88 | 0.97 |
| ethane | 281[5] | 1.5 | 1.4 |
| ethyl alcohol | | 1.02 | 0.84 |
| ethyl acetate | | 0.72 | 1.00 |
| ethylbenzene | 4.44[5] | 0.66[P] | 0.81[R] |
| ethylene | 116.0 | 1.6 | 1.5 |
| ethylene dibromide | 85.66 | 0.81 | 0.89 |
| ethylene dichloride | 0.61[C] | | |
| ethyl formate | | 0.84[P] | |
| ethylene glycol | | | 1.16 |
| formaldehyde | | | |
| formic acid | | 1.31[P] | 0.69[P] |
| furfural | | | 1.04[R] |
| glycerol | | | 0.82 |
| glycine | | | 1.06 |

**Appendix A.9** (continued)

| substance | Henry's law constant, $H'$ ($10^7$ N/m$^2$)* | air diffusion coefficient, $D_{j,air}$ ($10^{-5}$ m$^2$/s)* | water diffusion coefficient, $D_{j,water}$ ($10^{-9}$ m$^2$/s)* |
|---|---|---|---|
| heptane | | 0.71[R] | |
| hexane | 944[S] | 0.8[R] | |
| hydrogen cyanide | 0.064 | 1.5 | 1.8 |
| hydrogen sulfide | 5.52 | 1.7 | 1.6 |
| isobutyl acetate | 0.61[C] | | |
| isopropyl alcohol | | 1.07[V] | 0.87[R] |
| methane | 374 | 2.2 | 1.8 |
| methyl alcohol | | 1.33 | 0.84 |
| methyl acetate | | 0.84[P] | |
| methyl chloroform | 0.346 | 0.78 | 0.81 |
| methyl chloride | 13.3[L] | 1.3 | 1.5 |
| methylene chloride | 1.67 | | |
| methyl formate | | 0.87[P] | |
| naphthalene | 0.043[S] | 0.51[P] | |
| nitric oxide | 291.0 | 2.0 | 2.4 |
| nitrous oxide | 22.7 | 1.5 | 1.8 |
| nitrobenzene | | 0.86[V] | |
| octane | 1667[S] | | |
| oxalic acid | | | 1.53 |
| ozone | 46.4 | | 2.0 |
| perchloroethylene | 2.42 | 0.74 | 0.76 |
| phosgene | | 0.80 | |
| phosphine | 398[S] | 1.6 | |
| propane | | 0.88 | 0.97 |
| propylene | 57.3 | | 1.1 |
| n-propyl acetate | | 0.67[P] | |
| propyl alcohol | | 0.85[P] | 1.1[P] |
| pyridine | | | 0.58 |
| sulfur dioxide | 0.485 | 1.3 | 1.7 |
| toluene | 3.72[S] | 0.71 | 0.844[M] |
| trichloroethylene | 0.922 | 0.78 | 0.81 |
| urethane | | | 1.06 |
| o-xylene | 2.78[S] | | |

* multiply by exponent shown; e.g., for acetylene, $H'$ = 13.5 x $10^7$ N/m$^2$, $D_{j,air}$ = 1.7 x $10^{-5}$ m$^2$/s, $D_{j,water}$ = 2.0 x $10^{-9}$ m$^2$/s

C critical tables; see Crawford (1976) for details