| Combustible | Formula | Mol wt | Sp gr (air = 1) | BP, °C | $C_{st}$ (in air), vol pct | $\Delta H_f$ (25° C), kcal/mol | $\Delta H_c$ (net, 25° C), kcal/mol | Flash-point, °C | Minimum AIT, °C | Flammable limits | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | $L_{25}$, vol pct | $U_{25}$, vol pct |
| **AMINES (ALKYLS)** | | | | | | | | | | | |
| Methylamine (aminomethane) | $CH_3NH_2$ | 31.06 | 1.1 | −6.3 | 8.52 | −5.5 | 233 | NA | 430 | 4.9 | 20.7 |
| Ethylamine | $C_2H_5NH_2$ | 45.09 | 1.6 | 17 | 5.29 | −11.0 | 379 | NA | 385 | 3.5 | 14 |
| n-Propylamine | $C_3H_7NH_2$ | 59.11 | 2.0 | 48 | 3.83 | −17.3 | 525 | −37 | 318 | 2.0 | 10.4 |
| n-Butylamine | $C_4H_9NH_2$ | 73.14 | 2.5 | 78 | 3.01 | −22.0 | 672 | −12 | 312 | 1.7 | 9.8 |
| tert-Butylamine | $C_4H_9NH_2$ | 73.14 | 2.5 | 44 | 3.01 | −28.7 | 665 | NA | 380 | [7]1.7 | [7]8.9 |
| n-Amylamine (aminopentane) | $C_5H_{11}NH_2$ | 87.16 | 3.0 | 103 | 2.48 | NA | NA | 7 oc | NA | 2.2 | NA |
| Dimethylamine | $(CH_3)_2NH$ | 45.09 | 1.6 | 7.4 | 5.29 | −4.5 | 386 | NA | 400 | 2.8 | 14.4 |
| Diethylamine | $(C_2H_5)_2NH$ | 73.14 | 2.5 | 56 | 3.01 | −17.3 | 677 | NA | 312 | 1.8 | 10 |
| Trimethylamine | $(CH_3)_3N$ | 59.11 | NA | 2.9 | 3.83 | −5.7 | 537 | NA | NA | 2.0 | 12 |
| Triethylamine | $(C_2H_5)_3N$ | 101.19 | 3.5 | 89 | 2.10 | −23.8 | 974 | 7 oc | NA | 1.2 | 8 |
| **AMINES (UNSATURATES AND AROMATICS)** | | | | | | | | | | | |
| Ethyleneimine (aziridine) | $C_2H_4NH$ | 43.07 | 1.5 | 56 | 6.05 | 29.5 | 362 | −11 | 320 | 3.6 | 46 |
| Allylamine (3-aminopropene) | $C_3H_5NH_2$ | 57.09 | 2.0 | 58 | 4.22 | 6.9 | 491 | −29 | 375 | 2.2 | 22 |
| Aniline (phenyl amine) | $C_6H_5NH_2$ | 93.13 | 3.2 | 184 | 2.63 | 20.8 | 787 | 70 | 615 | [10]1.2 | [10]8.3 |
| Diethylaniline | $C_6H_5N(C_2H_5)_2$ | 149.24 | 5.0 | 216 | 1.47 | 9.6 | 1,384 | 85 | 630 | [2].8 | NA |
| Biphenylamine | $(C_6H_5)_2NH$ | 169.23 | 5.8 | 302 | 1.40 | 48.2 | 1,495 | 153 | 635 | [2].7 | NA |
| 2-Biphenylamine | $C_6H_4NH_2C_6H_5$ | 169.23 | NA | 299 | 1.40 | 29.1(s) | 1,476 | NA | 450 | [2].8 | NA |
| **AMINES (PYRIDINE DERIVATIVES)** | | | | | | | | | | | |
| Pyridine (azine) | $C_5H_5N$ | 79.10 | 2.7 | 116 | 3.24 | 33.5 | 648 | 20 | 482 | [3]1.8 | [4]12 |
| 3-Methyl pyridine (β-picoline) | $C_5H_4(CH_3)N$ | 93.13 | 3.2 | 144 | 2.63 | 25.4 | 792 | NA | 500 | [2]1.4 | NA |
| Quinoline (benzazine) | $C_9H_7N$ | 129.16 | 4.5 | 238 | 1.91 | 35.7(l) | 1,084 | NA | 480 | [2]1.0 | NA |
| Nicotine | $C_{10}H_{14}N_2$ | 162.24 | 5.6 | 246 | 1.53 | 10.2(l) | 1,355 | NA | 244 | [7].75 | NA |
| **AMIDES AND CYANIDES** | | | | | | | | | | | |
| Hydrogen cyanide | HCN | 27.03 | 0.9 | 26 | 14.34 | 31.2 | 154 | −18 | 538 | 5.6 | 40 |
| Methyl cyanide (acetonitrile) | $CH_3CN$ | 41.05 | 1.4 | 82 | 7.08 | 21.0 | 296 | 6 oc | 524 | 4.4 | 16 |
| Cyanogen | $C_2N_2$ | 52.04 | NA | −22 | 9.47 | 73.8 | 262 | −62 | NA | 6.6 | 32 |
| Vinyl cyanide (acrylonitrile) | $C_2H_3CN$ | 53.06 | 1.8 | 78 | 5.29 | 44.2 | 413 | 0 oc | 481 | 3.0 | 17 |
| Dimethyl formamide | $HCON(CH_3)_2$ | 73.09 | 2.5 | 149 | 4.69 | NA | NA | 57 | 435 | [7]1.8 | [7]14 |
| Acetone cyanohydrin | $C_3H_6OHCN$ | 85.11 | 2.9 | NA | 3.84 | NA | NA | 74 | 687 | [6]2.2 | [6]12 |
| Acetanilide (phenylacetamide) | $C_6H_5NHCOCH_3$ | 135.17 | 4.65 | 304 | 2.10 | −50.3(s) | 962 | 174 oc | 540 | [2]1.0 | NA |
| **HYDRAZINES** | | | | | | | | | | | |
| Hydrazine | $N_2H_4$ | 32.05 | 1.1 | 114 | 17.32 | 22.8 | 138 | 38 | 270 | [6]4.7 | [6]100 |
| Methylhydrazine | $CH_3N_2H_3$ | 46.07 | 1.6 | 87 | 7.73 | 20.4 | 259 | 21 | 185 | 4.0 | NA |
| 1,1-Dimethylhydrazine (UDMH) | $(CH_3)_2N_2H_2$ | 60.11 | 2.1 | 63 | 4.97 | 20.3 | 440 | −6 | 250 | 2.0 | [7]95 |
| **NITRATED COMPOUNDS (NITRO ALKYLS AND AROMATICS)** | | | | | | | | | | | |
| Nitromethane | $CH_3NO_2$ | 61.04 | 2.1 | 101 | 21.83 | −17.9 | 163 | 35 | 418 | [6]7.3 | NA |
| Nitroethane | $C_2H_5NO_2$ | 75.07 | 2.6 | 115 | 8.52 | −24.2 | 308 | 28 | 414 | 3.4 | NA |
| 1-Nitropropane | $C_3H_7NO_2$ | 89.09 | 3.1 | 131 | 5.29 | −29.8 | 454 | 49 oc | 421 | [6]2.2 | NA |
| 2-Nitropropane | $C_3H_7NO_2$ | 89.09 | 3.1 | 120 | 5.29 | −33.5 | 451 | 28 | 428 | [6]2.5 | NA |
| Nitrobenzene (nitrobenzol) | $C_6H_5NO_2$ | 123.11 | 4.3 | 211 | 3.24 | 3.8(l) | 713 | 88 | 482 | [5]1.8 | NA |
| o-Nitrotoluene | $C_7H_7NO_2$ | 137.14 | 4.7 | 220 | 2.63 | −.4(l) | 860 | 106 | NA | NA | NA |
| **NITRATED COMPOUNDS (NITRITES AND NITRATES)** | | | | | | | | | | | |
| Ethyl nitrite | $C_2H_5NO_2$ | 75.07 | 2.6 | 17 | 8.52 | −24.8 | 308 | −35 | 90 | 3.0 | 50 |
| Ethyl nitrate | $C_2H_5NO_3$ | 91.07 | 3.1 | 87 | 10.68 | −36.8 | 296 | 10 | NA | 4.0 | NA |
| n-Propyl nitrate | $C_3H_7NO_3$ | 105.10 | NA | 110 | 6.05 | −41.6 | 443 | 20 | 175 | [8]1.8 | [8]100 |
| n-Amyl nitrite | $C_5H_{11}NO_2$ | 117.15 | 4.0 | 105 | 3.01 | NA | NA | NA | 210 | [2]1.0 | NA |
| n-Amyl nitrate | $C_5H_{11}NO_3$ | 133.15 | NA | ~155 | 3.24 | NA | NA | 52 oc | 195 | [6]1.1 | NA |

See footnotes on page 77.

Kuchta, J. M. (1985). **Investigation of fire and explosion accidents in the chemical, mining, and fuel-related industries-a manual.** Bulletin 680, U.S. Bureau of Mines.