

| Gas                  | Formula                        | Molecular weight | Density - $\rho$ -                         |  |
|----------------------|--------------------------------|------------------|--|--|
|                      |                                |                  | kg/m <sup>3</sup>                          | lb <sub>m</sub> /ft <sup>3</sup>             |
| Acetylene (ethyne)   | C <sub>2</sub> H <sub>2</sub>  | 26               | 1.092 <sup>1)</sup><br>1.170 <sup>2)</sup> | 0.0682 <sup>1)</sup><br>0.0729 <sup>2)</sup> |
| Air                  |                                | 29               | 1.205 <sup>1)</sup><br>1.293 <sup>2)</sup> | 0.0752 <sup>1)</sup><br>0.0806 <sup>2)</sup> |
| Ammonia              | NH <sub>3</sub>                | 17.031           | 0.717 <sup>1)</sup><br>0.769 <sup>2)</sup> | 0.0448 <sup>1)</sup><br>0.0480 <sup>2)</sup> |
| Argon                | Ar                             | 39.948           | 1.661 <sup>1)</sup>                        | 0.1037 <sup>1)</sup>                         |
| Benzene              | C <sub>6</sub> H <sub>6</sub>  | 78.11            | 3.486                                      | 0.20643                                      |
| Blast furnace gas    |                                |                  | 1.250 <sup>2)</sup>                        | 0.0780 <sup>2)</sup>                         |
| Butane               | C <sub>4</sub> H <sub>10</sub> | 58.1             | 2.489 <sup>1)</sup><br>2.5 <sup>2)</sup>   | 0.1554 <sup>1)</sup><br>0.156 <sup>2)</sup>  |
| Butylene (Butene)    | C <sub>4</sub> H <sub>8</sub>  | 56.11            | 2.504                                      | 0.148 <sup>2)</sup>                          |
| Carbon dioxide       | CO <sub>2</sub>                | 44.01            | 1.842 <sup>1)</sup><br>1.977 <sup>2)</sup> | 0.1150 <sup>1)</sup><br>0.1234 <sup>2)</sup> |
| Carbon disulphide    |                                | 76.13            |  |  |
| Carbon monoxide      | CO                             | 28.01            | 1.165 <sup>1)</sup><br>1.250 <sup>2)</sup> | 0.0727 <sup>1)</sup><br>0.0780 <sup>2)</sup> |
| Carbureted Water Gas |                                |                  |  | 0.048  |
| Chlorine             | Cl <sub>2</sub>                | 70.906           | 2.994 <sup>1)</sup>                        | 0.1869 <sup>1)</sup>                         |
| Coke Oven Gas        |                                |                  |  | 0.034 <sup>2)</sup>                          |
| Combustion products  |                                |                  | 1.11 <sup>2)</sup>                         | 0.069 <sup>2)</sup>                          |

|                                       |                               |        |  |  |
|---------------------------------------|-------------------------------|--------|--|--|
| Cyclohexane                           |                               | 84.16  |  |  |
| Digester Gas<br>(Sewage or<br>Biogas) |                               |        |  | 0.062  |
| Ethane                                | C <sub>2</sub> H <sub>6</sub> | 30.07  | 1.264 <sup>1)</sup>                        | 0.0789 <sup>1)</sup>                         |
| Ethyl Alcohol                         |                               | 46.07  |  |  |
| Ethyl Chloride                        |                               | 64.52  |  |  |
| Ethylene                              | C <sub>2</sub> H <sub>4</sub> | 28.03  | 1.260 <sup>2)</sup>                        | 0.0786 <sup>2)</sup>                         |
| Helium                                | He                            | 4.02   | 0.1664 <sup>1)</sup>                       | 0.01039 <sup>1)</sup>                        |
| N-Heptane                             |                               | 100.20 |  |  |
| Hexane                                |                               | 86.17  |  |  |
| Hydrogen                              | H <sub>2</sub>                | 2.016  | 0.0899 <sup>2)</sup>                       | 0.0056 <sup>2)</sup>                         |
| Hydrochloric Acid                     |                               | 36.47  |  |  |
| Hydrogen<br>Chloride                  | HCl                           | 36.5   | 1.528 <sup>1)</sup>                        | 0.0954 <sup>1)</sup>                         |
| Hydrogen Sulfide                      | H <sub>2</sub> S              | 34.076 | 1.434 <sup>1)</sup>                        | 0.0895 <sup>1)</sup>                         |
| Methane                               | CH <sub>4</sub>               | 16.043 | 0.668 <sup>1)</sup><br>0.717 <sup>2)</sup> | 0.0417 <sup>1)</sup><br>0.0447 <sup>2)</sup> |
| Methyl Alcohol                        |                               | 32.04  |  |  |
| Methyl Butane                         |                               | 72.15  |  |  |
| Methyl Chloride                       |                               | 50.49  |  |  |
| Natural gas                           |                               | 19.5   | 0.7 - 0.9 <sup>2)</sup>                    | 0.044 - 0.056 <sup>2)</sup>                  |

|                        |                               |        |  |  |
|------------------------|-------------------------------|--------|--|--|
| Neon                   | Ne                            | 20.179 |  | 0.052  |
| Nitric oxide           | NO                            | 30.0   | 1.249 <sup>1)</sup>                        | 0.0780 <sup>1)</sup>                         |
| Nitrogen               | N <sub>2</sub>                | 28.02  | 1.165 <sup>1)</sup><br>1.250 <sup>2)</sup> | 0.0727 <sup>1)</sup><br>0.0780 <sup>2)</sup> |
| Nitrogen Dioxide       | NO <sub>2</sub>               | 46.006 |  |  |
| N-Octane               |                               | 114.22 |  |  |
| Nitrous Oxide          | N <sub>2</sub> O              | 44.013 |  | 0.114  |
| Nitrous Trioxide       | NO <sub>3</sub>               | 62.005 |  |  |
| Oxygen                 | O <sub>2</sub>                | 32     | 1.331 <sup>1)</sup><br>1.429 <sup>2)</sup> | 0.0831 <sup>1)</sup><br>0.0892 <sup>2)</sup> |
| Ozone                  | O <sub>3</sub>                | 48.0   |  | 0.125  |
| N-Pentane              |                               | 72.15  |  |  |
| Iso-Pentane            |                               | 72.15  |  |  |
| Propane                | C <sub>3</sub> H <sub>8</sub> | 44.09  | 1.882 <sup>1)</sup>                        | 0.1175 <sup>1)</sup>                         |
| Propene<br>(propylene) | C <sub>3</sub> H <sub>6</sub> | 42.1   | 1.748 <sup>1)</sup>                        | 0.1091 <sup>1)</sup>                         |
| R-11                   |                               | 137.37 |  |  |
| R-12                   |                               | 120.92 |  |  |
| R-22                   |                               | 86.48  |  |  |
| R-114                  |                               | 170.93 |  |  |
| R-123                  |                               | 152.93 |  |  |

|                           |                               |        |  |  |
|---------------------------|-------------------------------|--------|--|--|
| R-134a                    |                               | 102.03 |  |  |
| Sasol                     |                               |        |  | 0.032  |
| Sulfur                    | S                             | 32.06  |  | 0.135  |
| Sulfur Dioxide            | SO <sub>2</sub>               | 64.06  | 2.279 <sup>1)</sup><br>2.926 <sup>2)</sup> | 0.1703 <sup>1)</sup><br>0.1828 <sup>2)</sup> |
| Sulfur Trioxide           | SO <sub>3</sub>               | 80.062 |  |  |
| Sulfuric Oxide            | SO                            | 48.063 |  |  |
| Toluene                   | C <sub>7</sub> H <sub>8</sub> | 92.141 | 4.111                                      | 0.2435                                       |
| Water Vapor               | H <sub>2</sub> O              | 18.016 | 0.804                                      | 0.048  |
| Water gas<br>(bituminous) |                               |        |  | 0.054  |

<sup>1)</sup> [NTP - Normal Temperature and Pressure](#) - is defined as air at 20°C (293.15 K, 68°F) and 1 atm ( 101.325 kN/m<sup>2</sup>, 101.325 kPa, 14.7 psia, 0 psig, 30 in Hg, 760 torr)

<sup>2)</sup> [STP - Standard Temperature and Pressure](#) - is defined as air at 0°C (273.15 K, 32°F) and 1 atm (101.325 kN/m<sup>2</sup>, 101.325 kPa, 14.7 psia, 0 psig, 30 in Hg, 760 torr)

- 1 lb/ft<sup>3</sup> = 16.018 kg/m<sup>3</sup>
- 1 kg/m<sup>3</sup> = 0.0624 lb/ft<sup>3</sup>