***Table 13.3** Molecular electronic terms*

| Configuration | Terms |
|---|---|
| $\sigma\sigma$ | $^1\Sigma^+$, $^3\Sigma^+$ |
| $\sigma\pi$ | $^1\Pi$, $^3\Pi$ |
| $\pi\pi$ | $^1\Sigma^+$, $^3\Sigma^+$, $^1\Sigma^-$, $^3\Sigma^-$, $^1\Delta$, $^3\Delta$ |
| $\pi\delta$ | $^1\Pi$, $^3\Pi$, $^1\Phi$, $^3\Phi$ |
| $\sigma$ | $^2\Sigma^+$ |
| $\sigma^2$; $\pi^4$; $\delta^4$ | $^1\Sigma^+$ |
| $\pi$; $\pi^3$ | $^2\Pi$ |
| $\pi^2$ | $^1\Sigma^+$, $^3\Sigma^-$, $^1\Delta$ |
| $\delta$; $\delta^3$ | $^2\Delta$ |
| $\delta^2$ | $^1\Sigma^+$, $^3\Sigma^-$, $^1\Gamma$ |

***Table 13.2** Properties of homonuclear diatomic molecules in their ground electronic states*

| Molecule | Ground Term | Bond Order | $D_e$/eV | $R_e$/Å |
|---|---|---|---|---|
| $H_2^+$ | $^2\Sigma_g^+$ | $\frac{1}{2}$ | 2.79 | 1.06 |
| $H_2$ | $^1\Sigma_g^+$ | 1 | 4.75 | 0.741 |
| $He_2^+$ | $^2\Sigma_u^+$ | $\frac{1}{2}$ | 2.5 | 1.08 |
| $He_2$ | $^1\Sigma_g^+$ | 0 | 0.0009 | 3.0 |
| $Li_2$ | $^1\Sigma_g^+$ | 1 | 1.07 | 2.67 |
| $Be_2$ | $^1\Sigma_g^+$ | 0 | 0.1 | 2.5 |
| $B_2$ | $^3\Sigma_g^-$ | 1 | 3 | 1.59 |
| $C_2$ | $^1\Sigma_g^+$ | 2 | 6.3 | 1.24 |
| $N_2^+$ | $^2\Sigma_g^+$ | $2\frac{1}{2}$ | 8.85 | 1.12 |
| $N_2$ | $^1\Sigma_g^+$ | 3 | 9.91 | 1.10 |
| $O_2^+$ | $^2\Pi_g$ | $2\frac{1}{2}$ | 6.78 | 1.12 |
| $O_2$ | $^3\Sigma_g^-$ | 2 | 5.21 | 1.21 |
| $F_2$ | $^1\Sigma_g^+$ | 1 | 1.66 | 1.41 |
| $Ne_2$ | $^1\Sigma_g^+$ | 0 | 0.0036 | 3.1 |

Data from K. P. Huber and G. Herzberg, *Constants of Diatomic Molecules* (vol. IV of *Molecular Spectra and Molecular Structure*), Van Nostrand, New York, 1979; and B. Liu and A. D. McLean, *J. Chem. Phys.*, **72**, 3418 (1980).