

**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	$D_e/\text{eV}$	$R_e/\text{\AA}$
$\text{H}_2^+$	$^2\Sigma_g^+$	$\frac{1}{2}$	2.79	1.06
$\text{H}_2$	$^1\Sigma_g^+$	1	4.75	0.741
$\text{He}_2^+$	$^2\Sigma_u^+$	$\frac{1}{2}$	2.5	1.08
$\text{He}_2$	$^1\Sigma_g^+$	0	0.0009	3.0
$\text{Li}_2$	$^1\Sigma_g^+$	1	1.07	2.67
$\text{Be}_2$	$^1\Sigma_g^+$	0	0.1	2.5
$\text{B}_2$	$^3\Sigma_g^-$	1	3	1.59
$\text{C}_2$	$^1\Sigma_g^+$	2	6.3	1.24
$\text{N}_2^+$	$^2\Sigma_g^+$	$2\frac{1}{2}$	8.85	1.12
$\text{N}_2$	$^1\Sigma_g^+$	3	9.91	1.10
$\text{O}_2^+$	$^2\Pi_g$	$2\frac{1}{2}$	6.78	1.12
$\text{O}_2$	$^3\Sigma_g^-$	2	5.21	1.21
$\text{F}_2$	$^1\Sigma_g^+$	1	1.66	1.41
$\text{Ne}_2$	$^1\Sigma_g^+$	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).