

SUPPLEMENTAL INFORMATION

$$1 \text{ J} = 1 \text{ kg} \cdot \text{m}^2/\text{s}^2$$

$$E_k = \frac{1}{2} mv^2$$

$$\text{K} = ^\circ\text{C} + 273.15$$

$$^\circ\text{C} = 5/9(^{\circ}\text{F} - 32)$$

$$h = 6.626 \times 10^{-34} \text{ J} \cdot \text{s}$$

$$c = 2.998 \times 10^8 \text{ m/s}$$

$$R_H = 1.097 \times 10^7 \text{ m}^{-1}$$

$$\mu = Qr$$

$$e = 1.60 \times 10^{-19} \text{ C}$$

$$1 \text{ D} = 3.34 \times 10^{-30} \text{ C} \cdot \text{m}$$

$$N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$$

$$R = 0.08206 \text{ L} \cdot \text{atm}/\text{mol} \cdot \text{K}$$

$$R = 8.314 \text{ J}/\text{mol} \cdot \text{K}$$

$$PV = nRT$$

$$v_{rms} = \sqrt{\frac{3RT}{M}}$$

$$\lambda\nu = c$$

$$E = h\nu$$

$$\frac{1}{\lambda} = (R_H) \left(\frac{1}{n_1^2} - \frac{1}{n_2^2} \right)$$

$$E = (-hcR_H) \left(\frac{1}{n^2} \right) = (-2.18 \times 10^{-18} \text{ J}) \left(\frac{1}{n^2} \right)$$

$$\lambda = h/mv$$

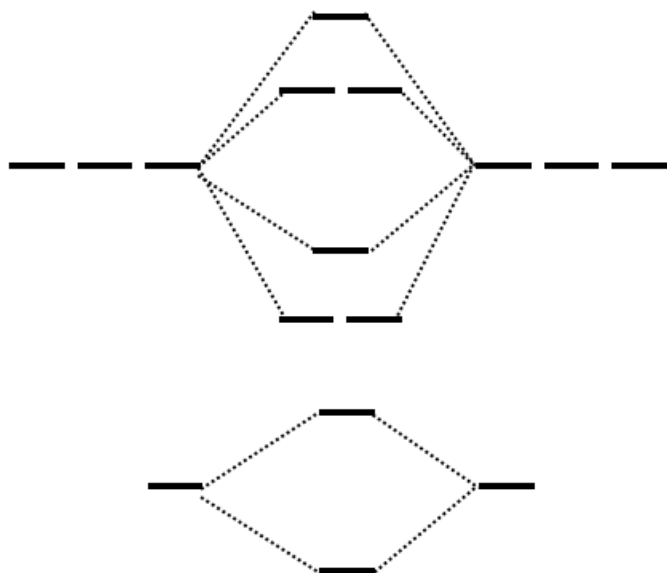
$$\Delta x \cdot \Delta(mv) \geq \frac{h}{4\pi}$$

TABLE 4.5 Activity Series of Metals in Aqueous Solution

Metal	Oxidation Reaction
Lithium	$\text{Li}(s) \longrightarrow \text{Li}^+(aq) + e^-$
Potassium	$\text{K}(s) \longrightarrow \text{K}^+(aq) + e^-$
Barium	$\text{Ba}(s) \longrightarrow \text{Ba}^{2+}(aq) + 2e^-$
Calcium	$\text{Ca}(s) \longrightarrow \text{Ca}^{2+}(aq) + 2e^-$
Sodium	$\text{Na}(s) \longrightarrow \text{Na}^+(aq) + e^-$
Magnesium	$\text{Mg}(s) \longrightarrow \text{Mg}^{2+}(aq) + 2e^-$
Aluminum	$\text{Al}(s) \longrightarrow \text{Al}^{3+}(aq) + 3e^-$
Manganese	$\text{Mn}(s) \longrightarrow \text{Mn}^{2+}(aq) + 2e^-$
Zinc	$\text{Zn}(s) \longrightarrow \text{Zn}^{2+}(aq) + 2e^-$
Chromium	$\text{Cr}(s) \longrightarrow \text{Cr}^{3+}(aq) + 3e^-$
Iron	$\text{Fe}(s) \longrightarrow \text{Fe}^{2+}(aq) + 2e^-$
Cobalt	$\text{Co}(s) \longrightarrow \text{Co}^{2+}(aq) + 2e^-$
Nickel	$\text{Ni}(s) \longrightarrow \text{Ni}^{2+}(aq) + 2e^-$
Tin	$\text{Sn}(s) \longrightarrow \text{Sn}^{2+}(aq) + 2e^-$
Lead	$\text{Pb}(s) \longrightarrow \text{Pb}^{2+}(aq) + 2e^-$
Hydrogen	$\text{H}_2(g) \longrightarrow 2\text{H}^+(aq) + 2e^-$
Copper	$\text{Cu}(s) \longrightarrow \text{Cu}^{2+}(aq) + 2e^-$
Silver	$\text{Ag}(s) \longrightarrow \text{Ag}^+(aq) + e^-$
Mercury	$\text{Hg}(l) \longrightarrow \text{Hg}^{2+}(aq) + 2e^-$
Platinum	$\text{Pt}(s) \longrightarrow \text{Pt}^{2+}(aq) + 2e^-$
Gold	$\text{Au}(s) \longrightarrow \text{Au}^{3+}(aq) + 3e^-$

TABLE 4.1 Solubility Guidelines for Common Ionic Compounds in Water

Soluble Ionic Compounds		Important Exceptions
Compounds containing	NO_3^-	None
	CH_3COO^-	None
	Cl^-	Compounds of Ag^+ , Hg_2^{2+} , and Pb^{2+}
	Br^-	Compounds of Ag^+ , Hg_2^{2+} , and Pb^{2+}
	I^-	Compounds of Ag^+ , Hg_2^{2+} , and Pb^{2+}
	SO_4^{2-}	Compounds of Sr^{2+} , Ba^{2+} , Hg_2^{2+} , and Pb^{2+}
Insoluble Ionic Compounds		Important Exceptions
Compounds containing	S^{2-}	Compounds of NH_4^+ , the alkali metal cations, Ca^{2+} , Sr^{2+} , and Ba^{2+}
	CO_3^{2-}	Compounds of NH_4^+ and the alkali metal cations
	PO_4^{3-}	Compounds of NH_4^+ and the alkali metal cations
	OH^-	Compounds of NH_4^+ , the alkali metal cations, Ca^{2+} , Sr^{2+} , and Ba^{2+}

B₂, C₂, N₂ and their ions:**O₂, F₂, Ne₂ and their ions:**