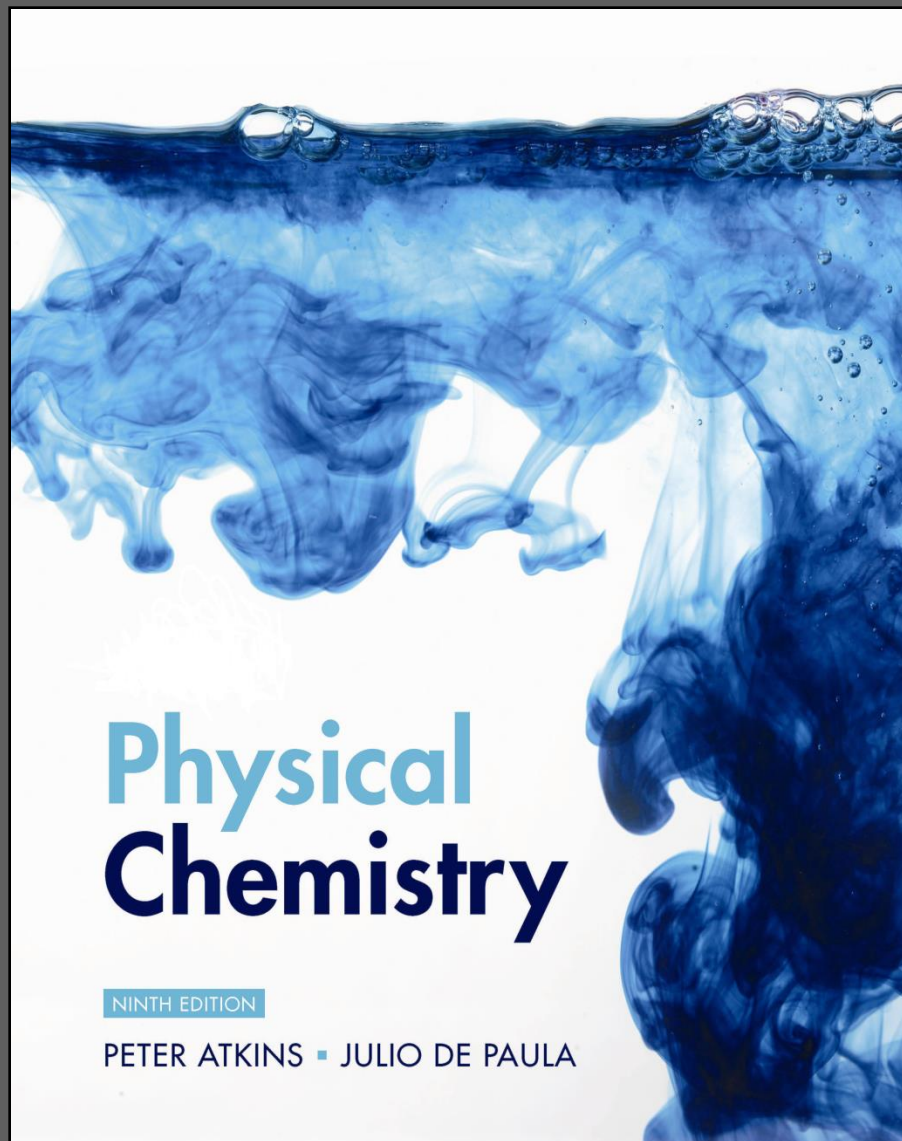
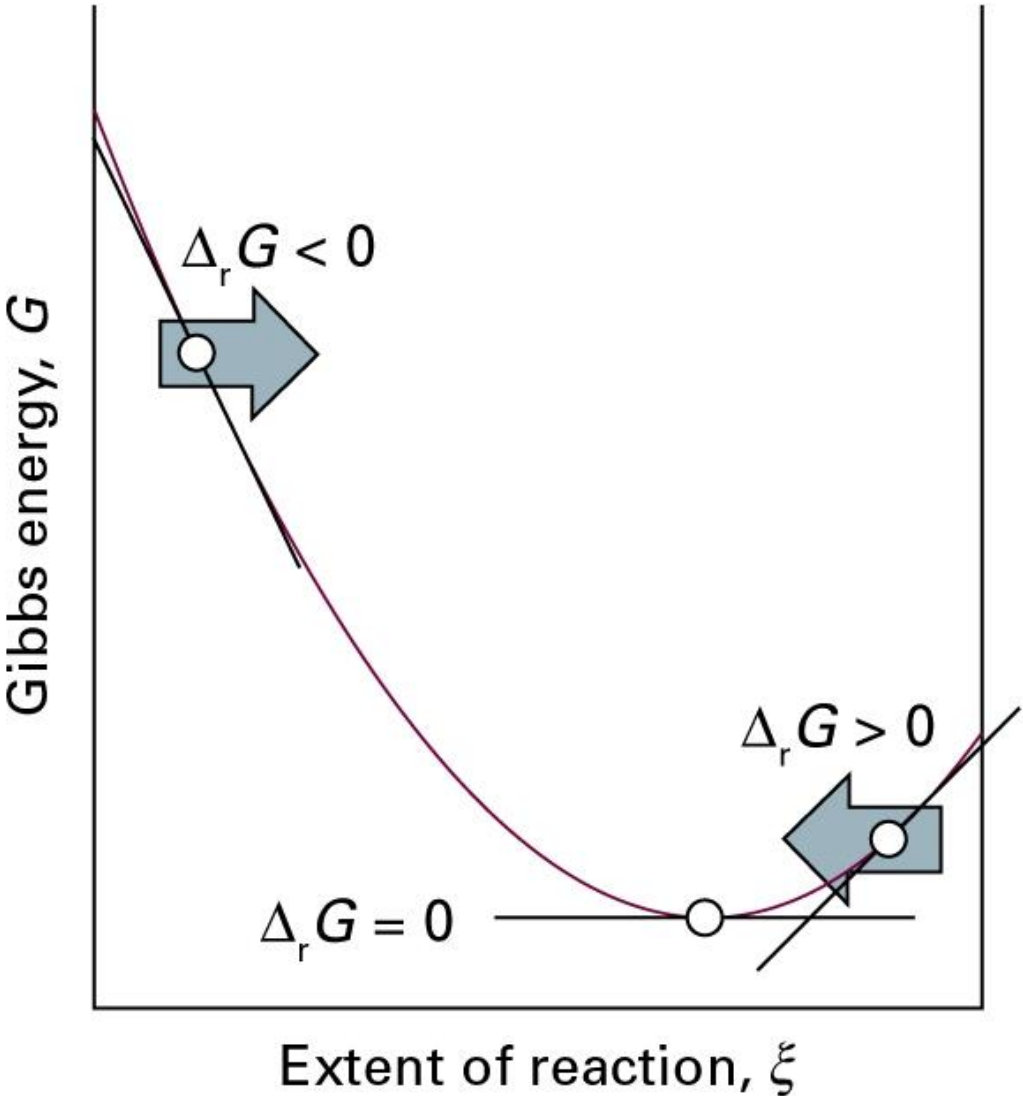


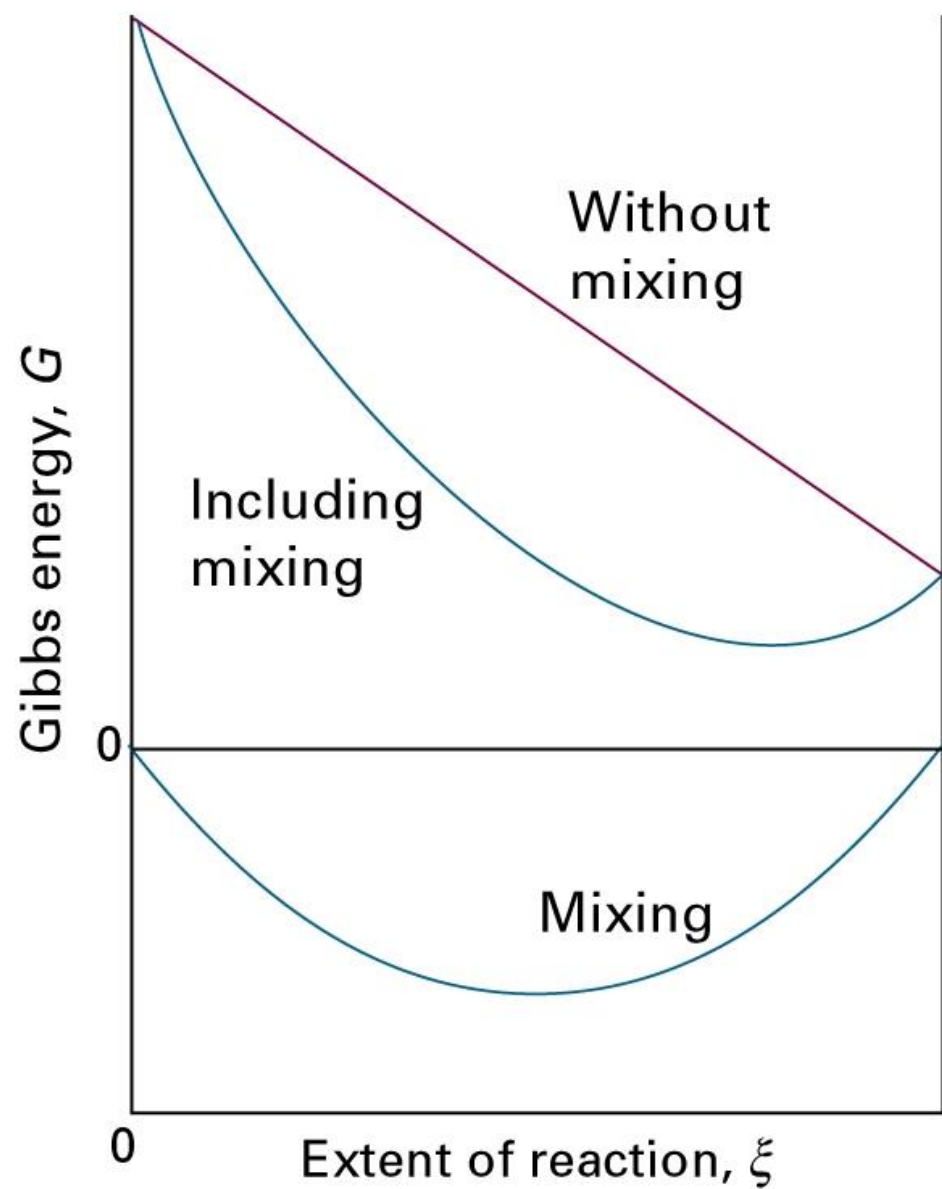
## CHAPTER NUMBER 6: Chemical Equilibrium

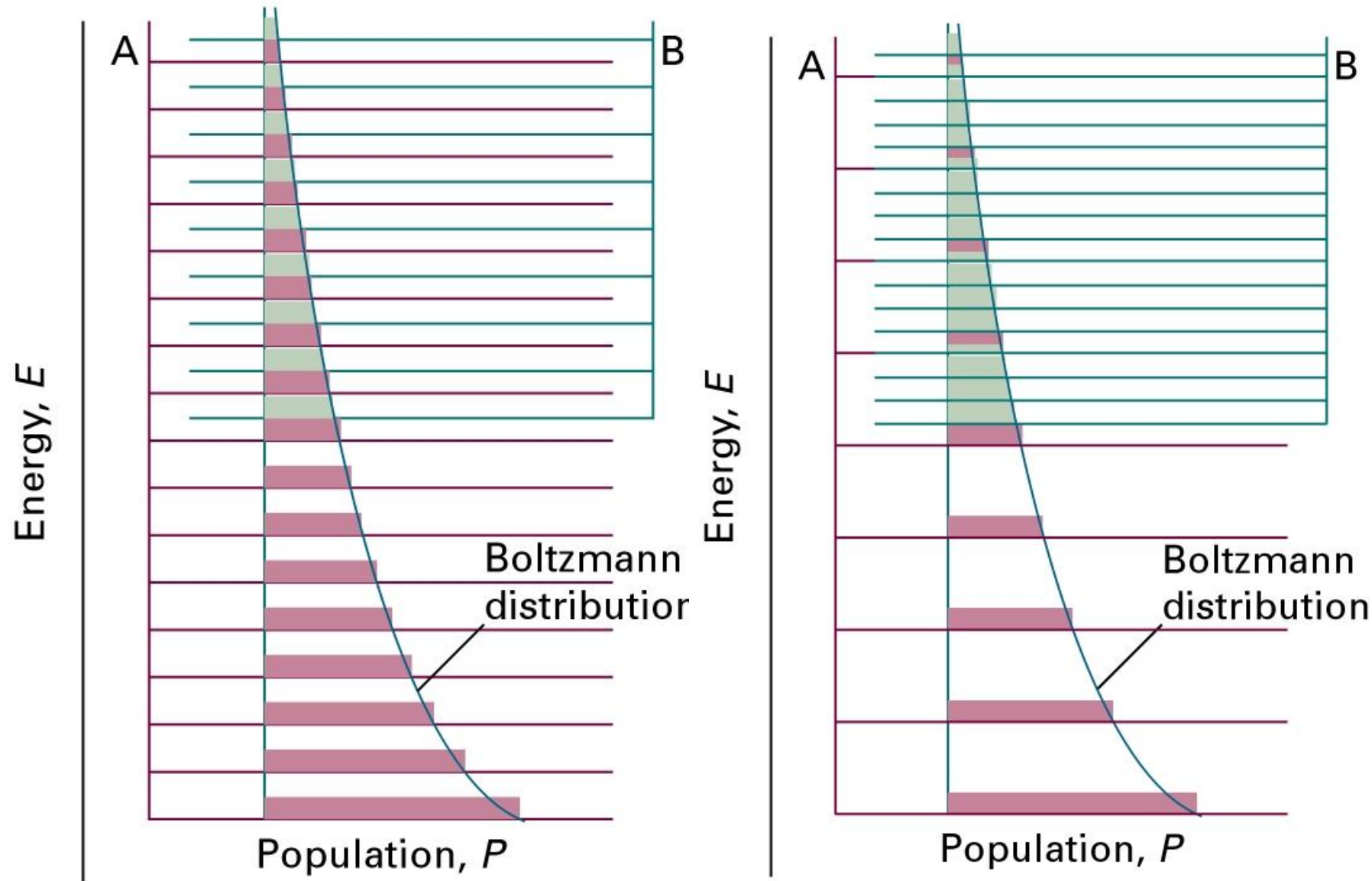


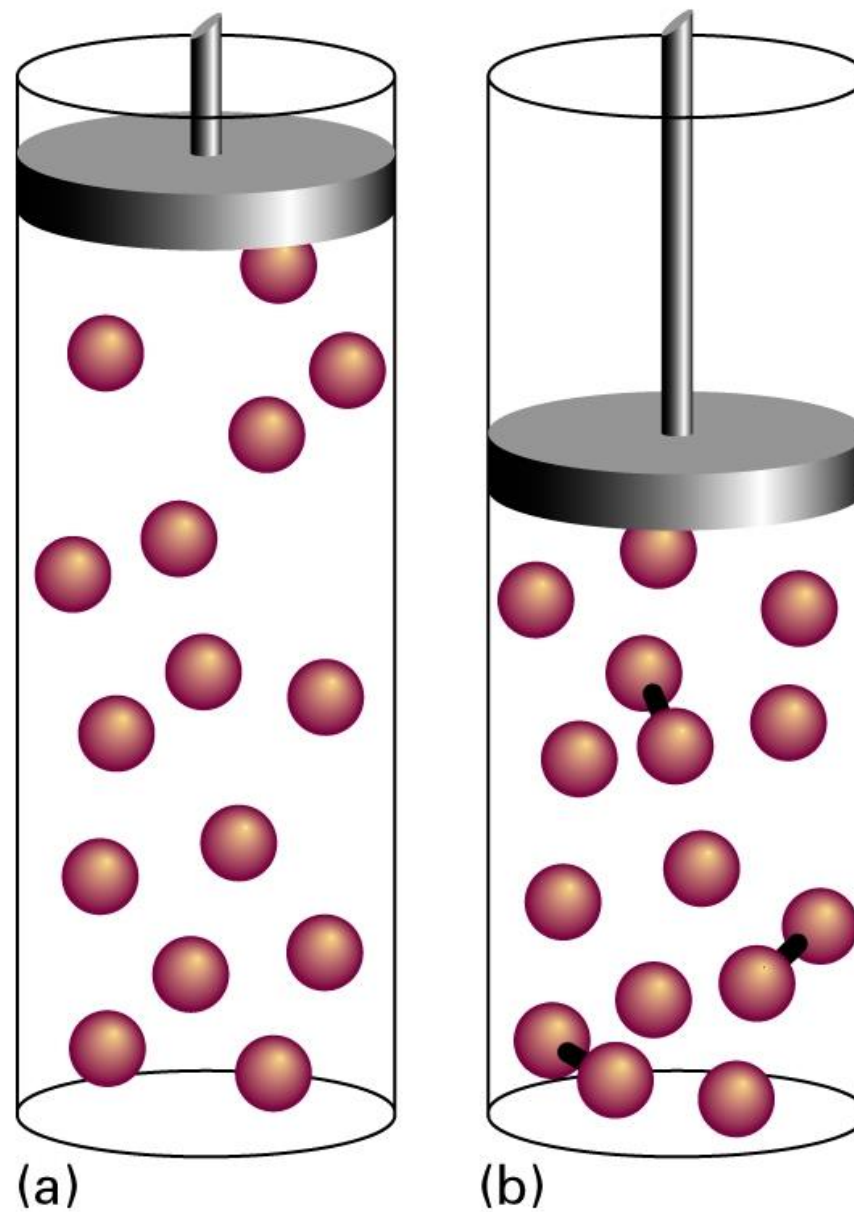
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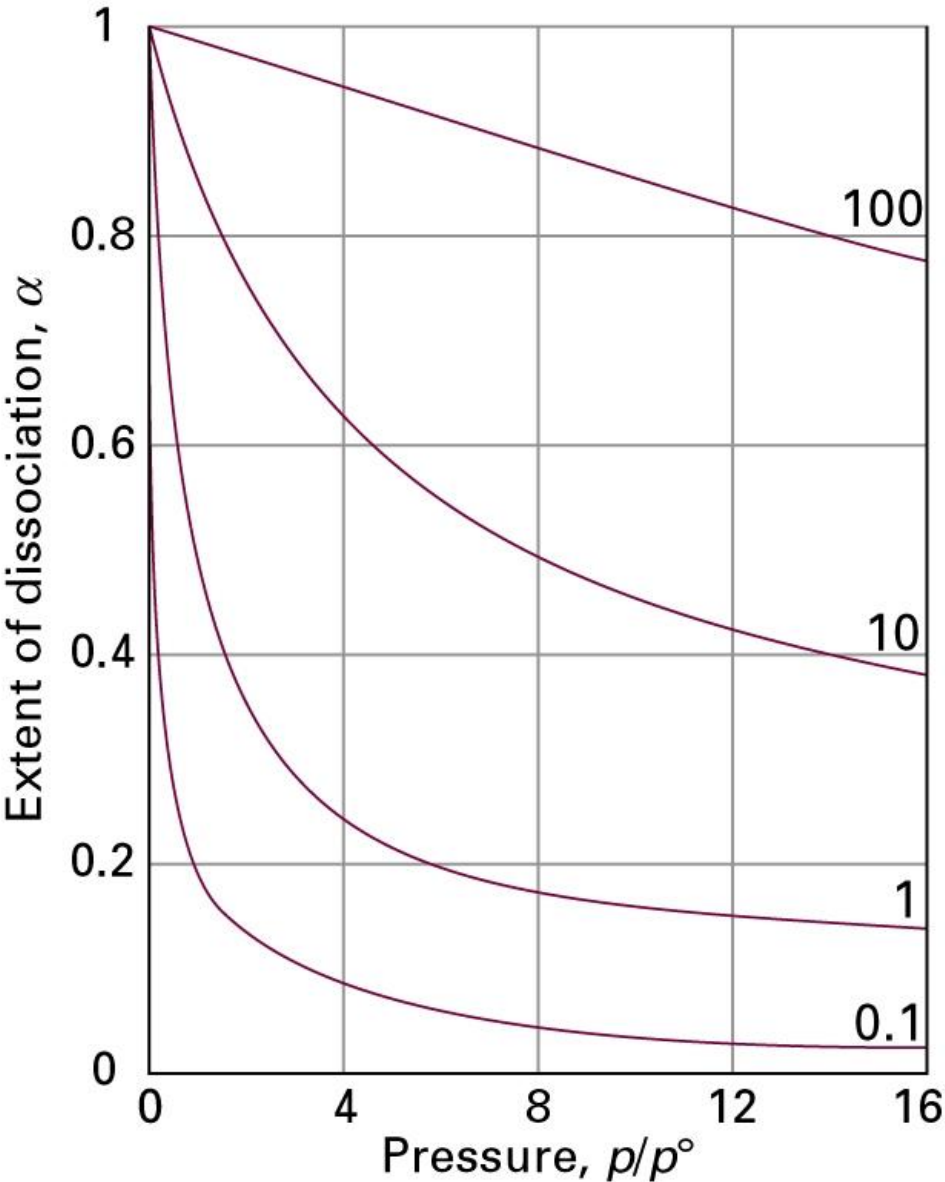
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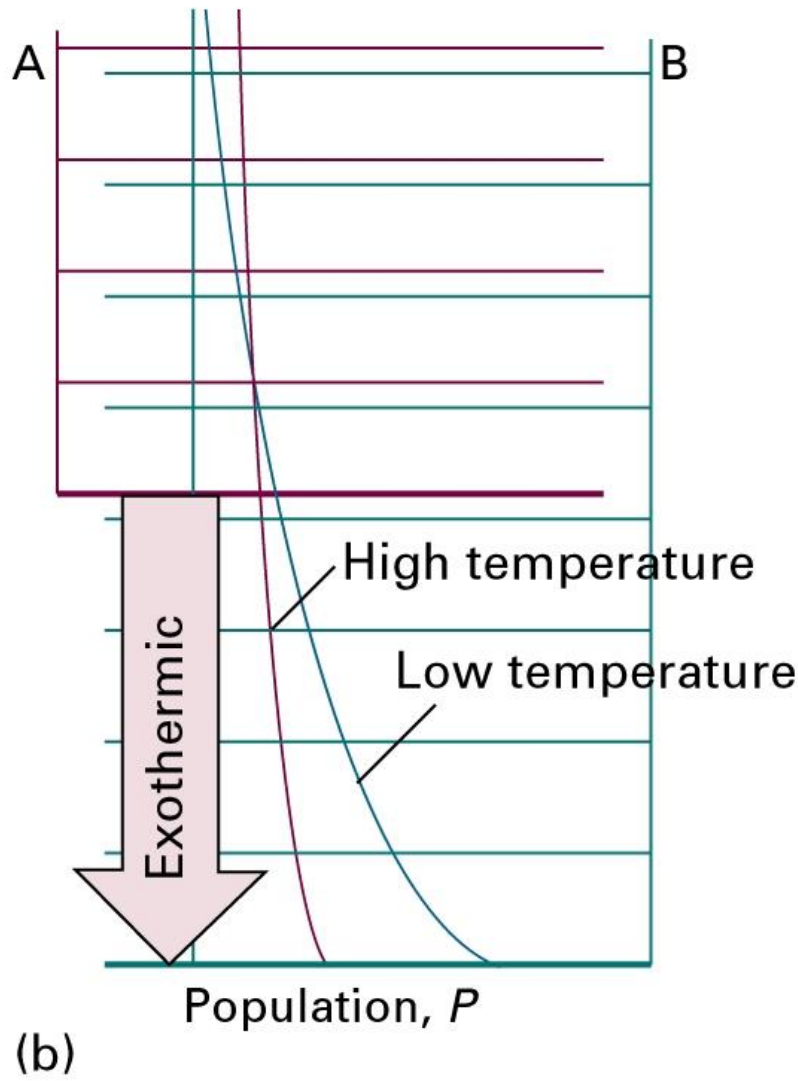
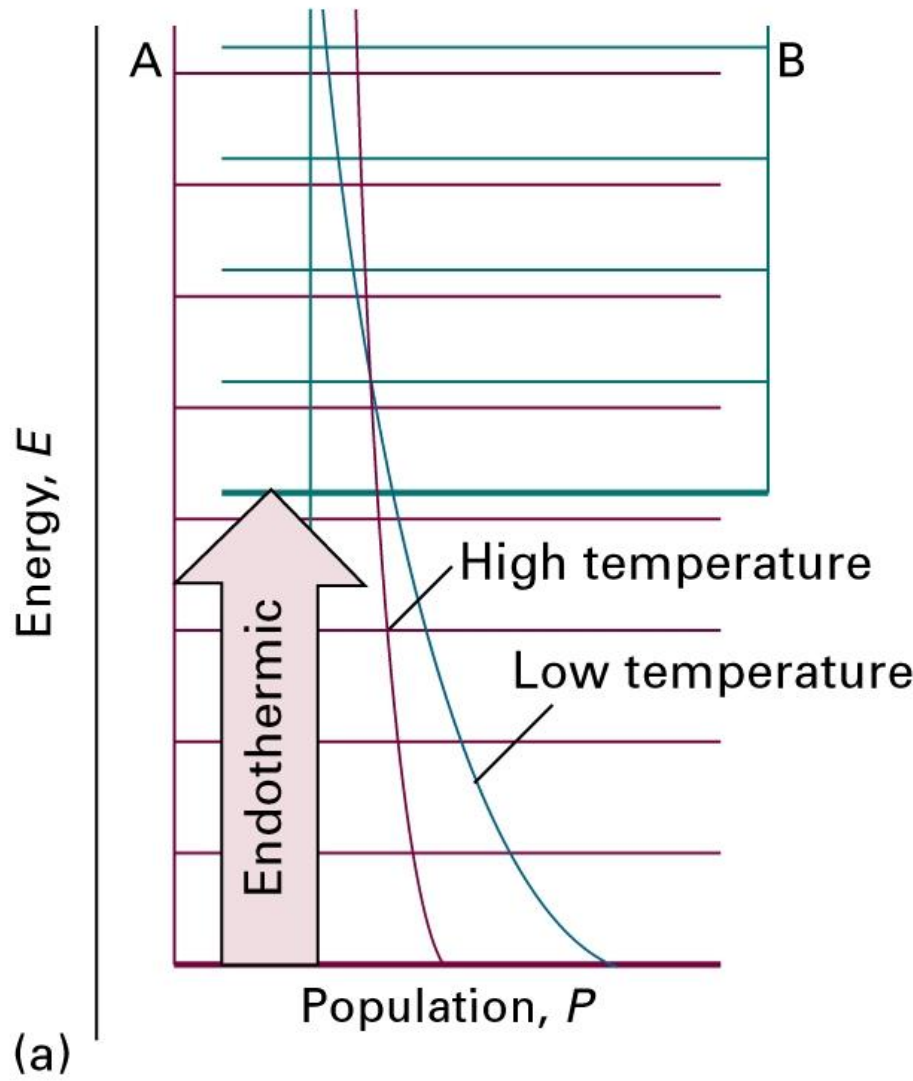


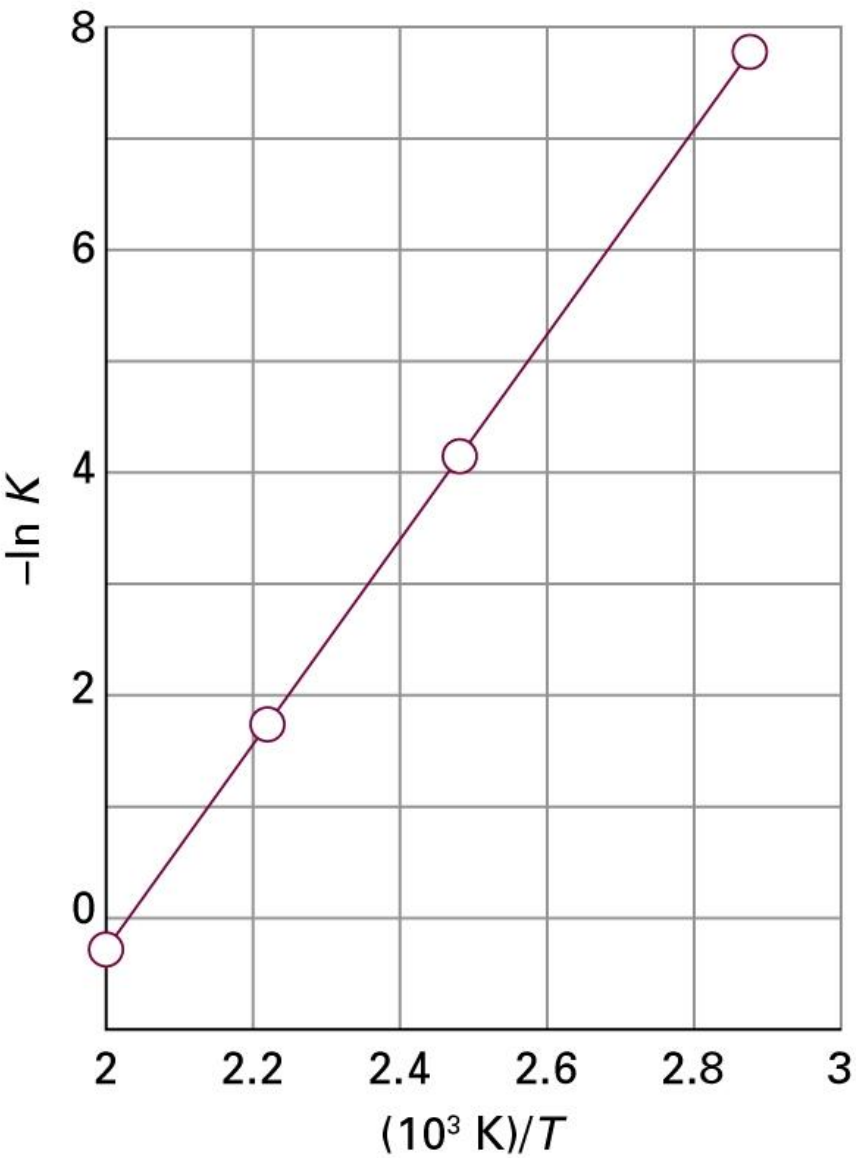




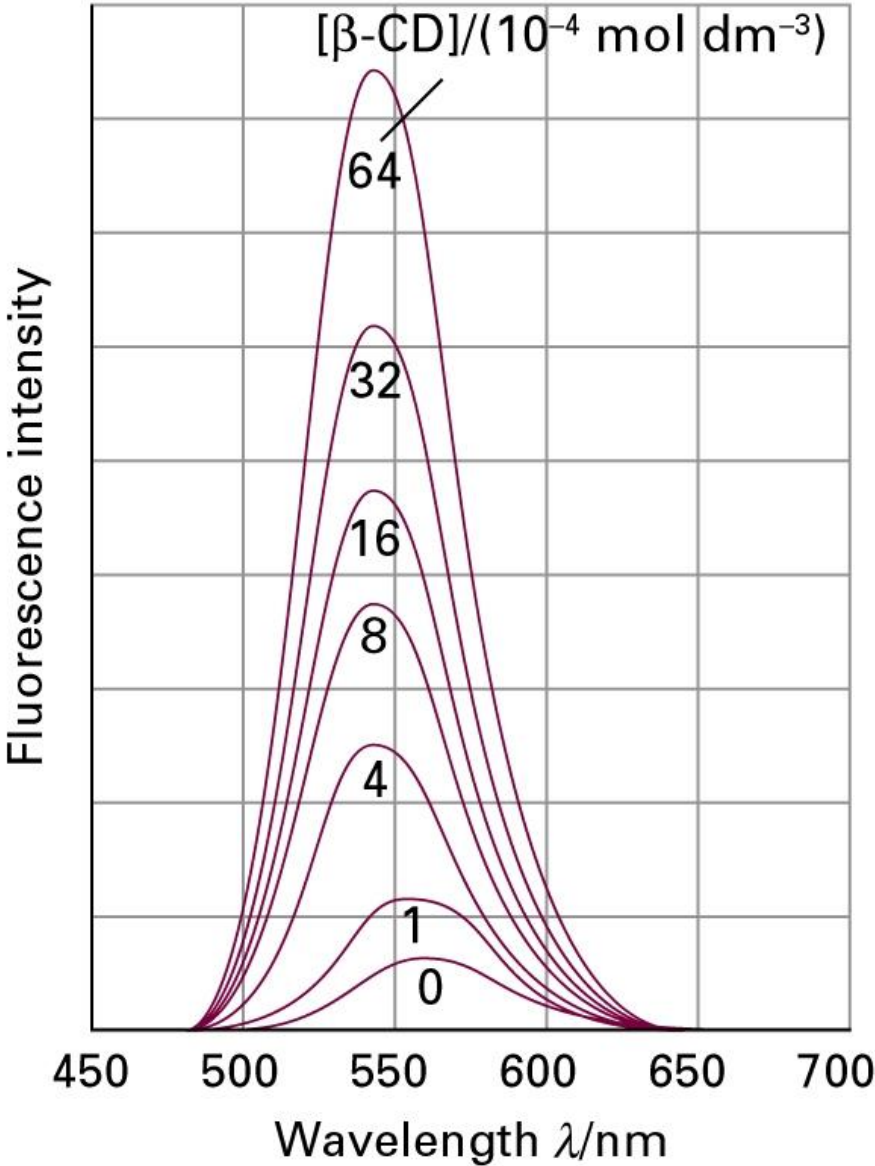


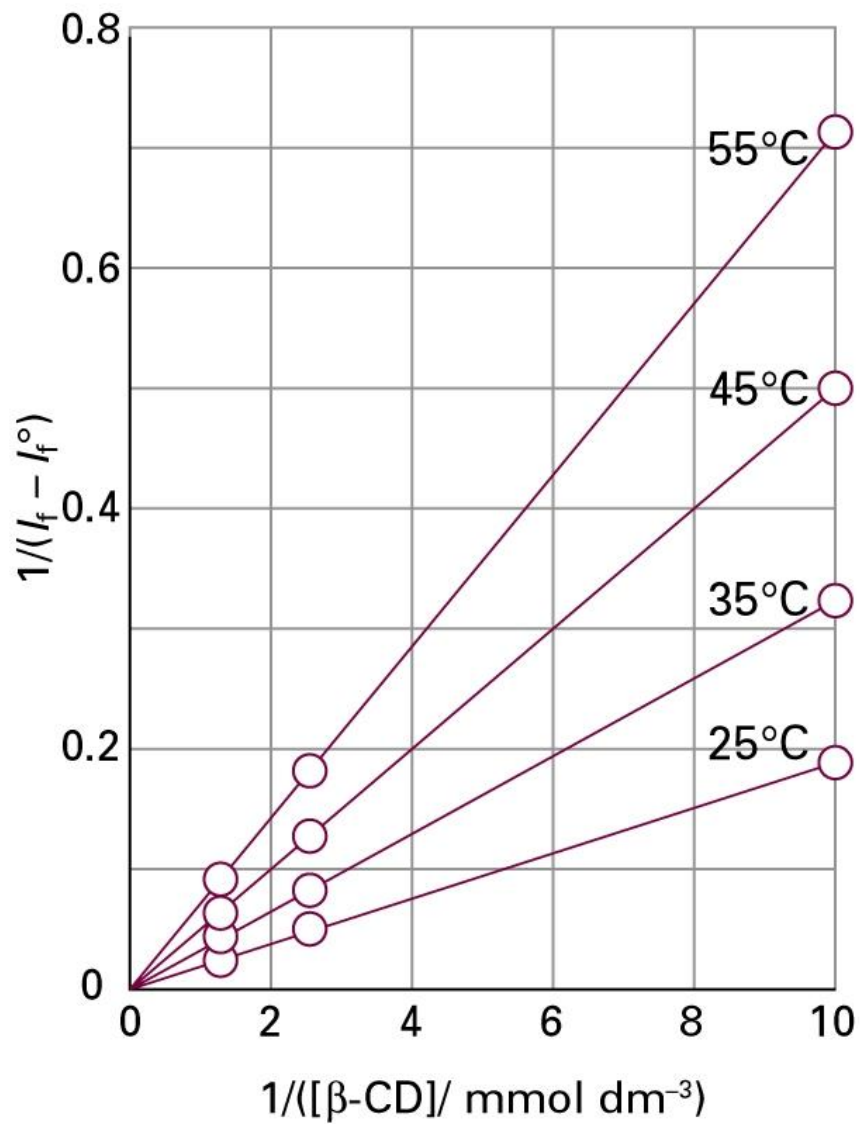


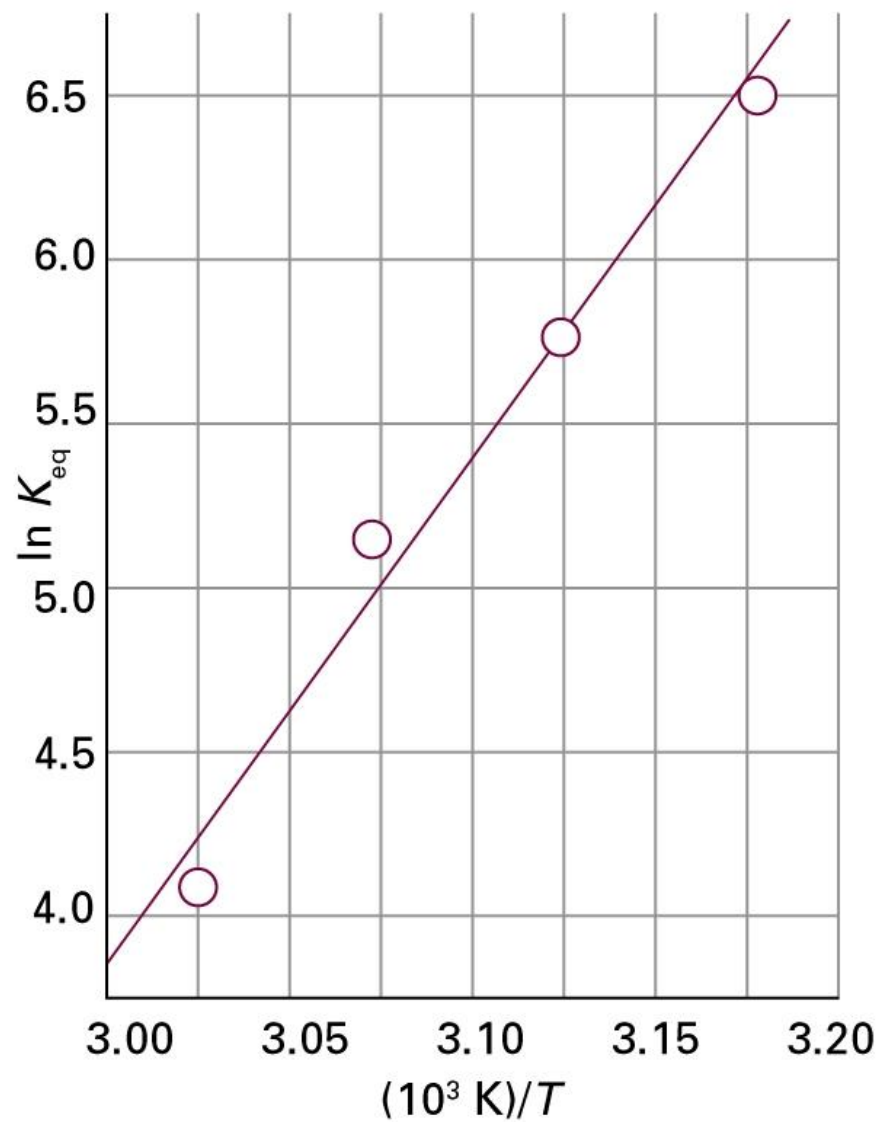






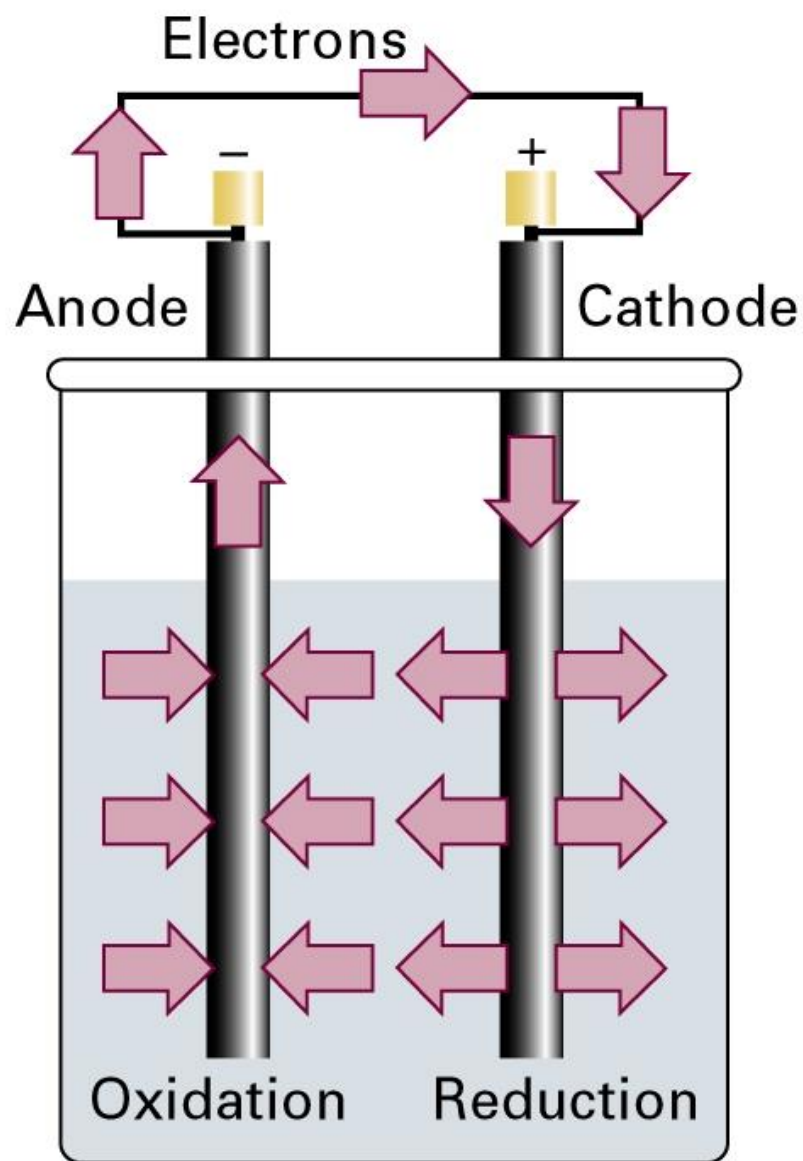


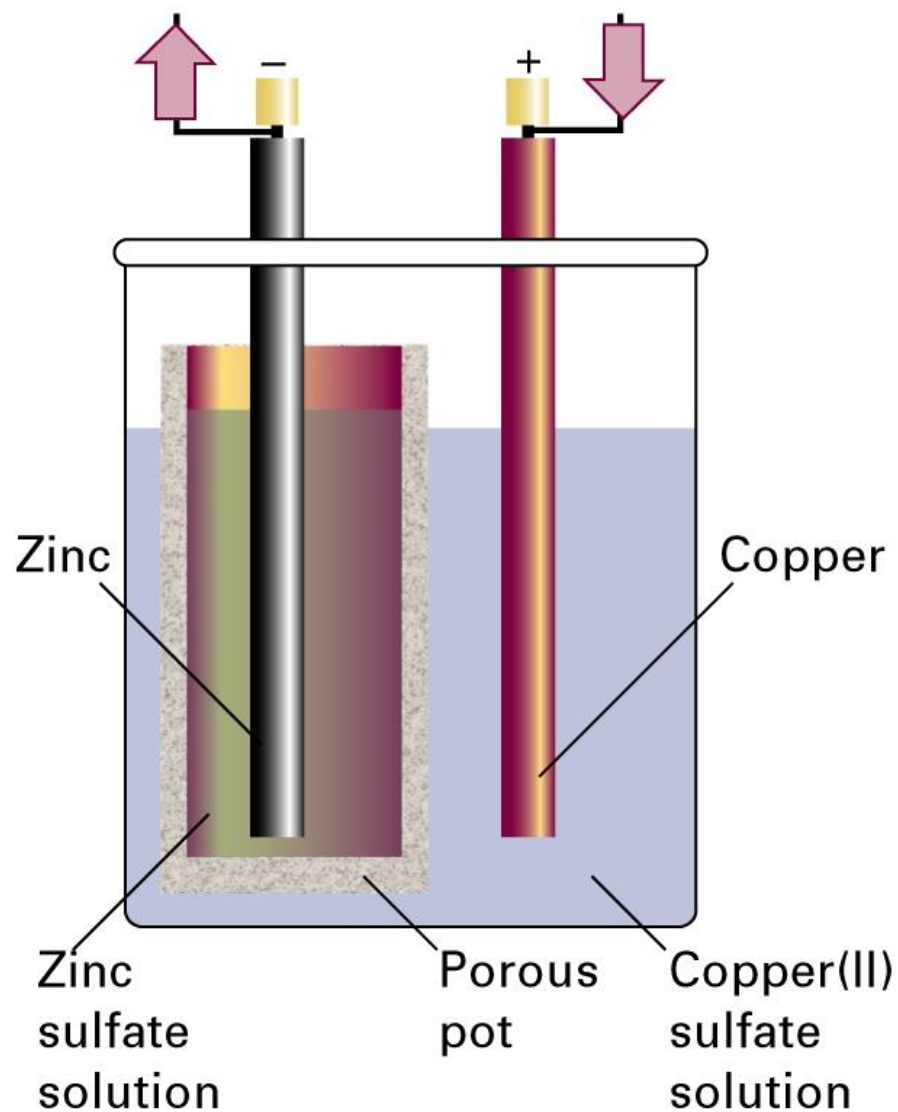


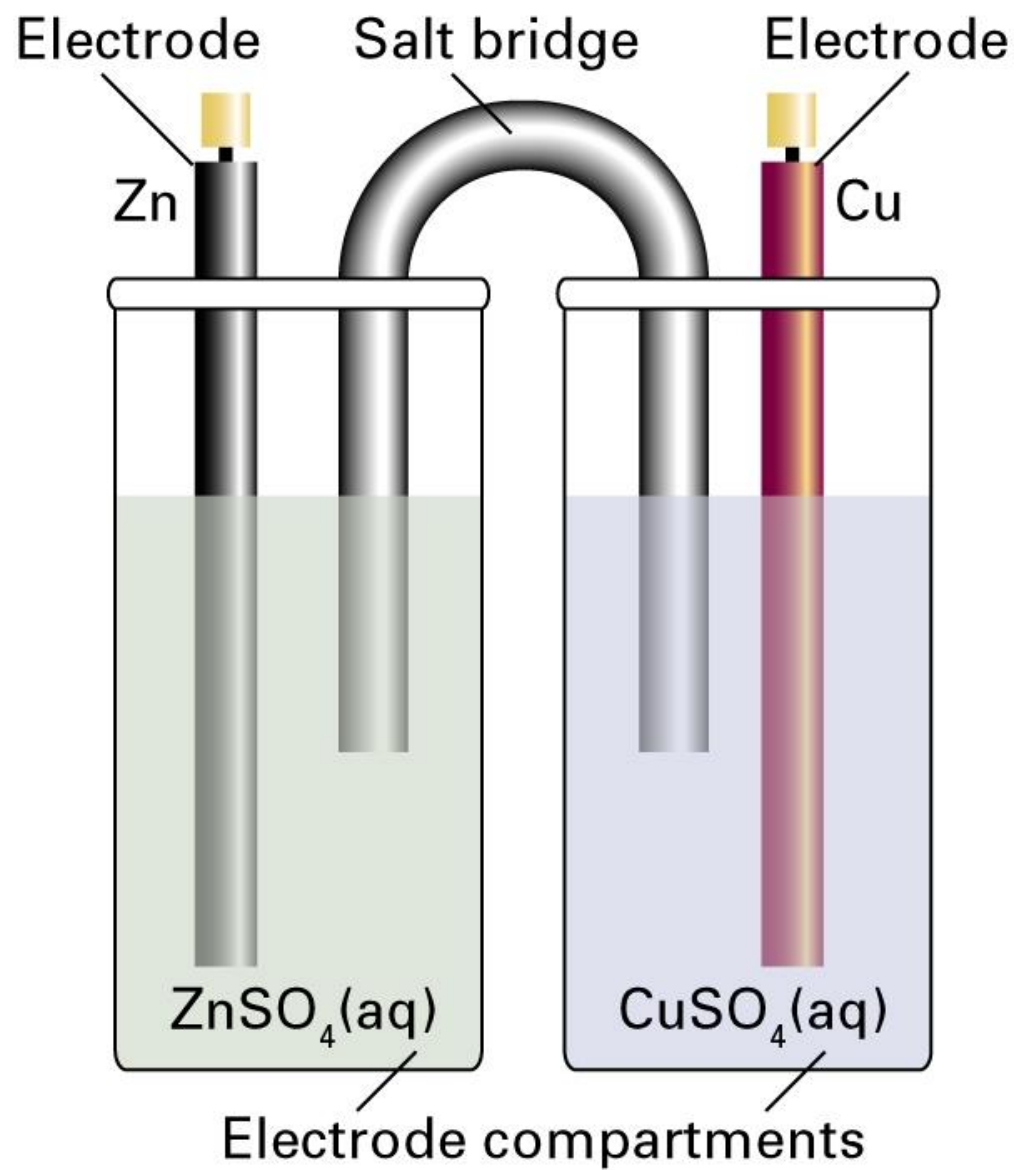


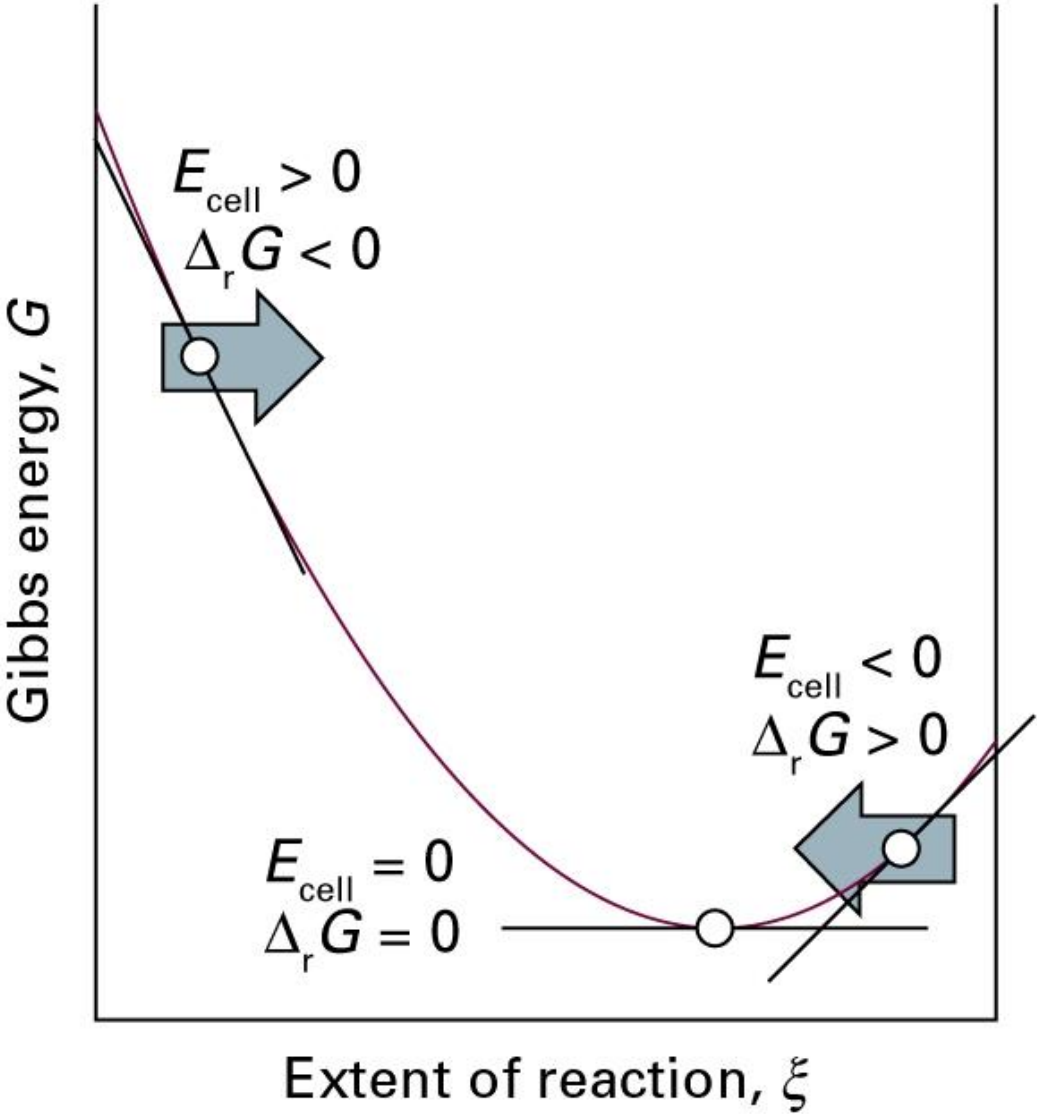
**Table 6.1** Varieties of electrode

Electrode type	Designation	Redox couple	Half-reaction
Metal/metal ion	$M(s)   M^+(aq)$	$M^+/M$	$M^+(aq) + e^- \rightarrow M(s)$
Gas	$Pt(s)   X_2(g)   X^+(aq)$	$X^+/X_2$	$X^+(aq) + e^- \rightarrow \frac{1}{2}X_2(g)$
	$Pt(s)   X_2(g)   X^-(aq)$	$X_2/X^-$	$\frac{1}{2}X_2(g) + e^- \rightarrow X^-(aq)$
Metal/insoluble salt	$M(s)   MX(s)   X^-(aq)$	$MX/M, X^-$	$MX(s) + e^- \rightarrow M(s) + X^-(aq)$
Redox	$Pt(s)   M^+(aq), M^{2+}(aq)$	$M^{2+}/M^+$	$M^{2+}(aq) + e^- \rightarrow M^+(aq)$

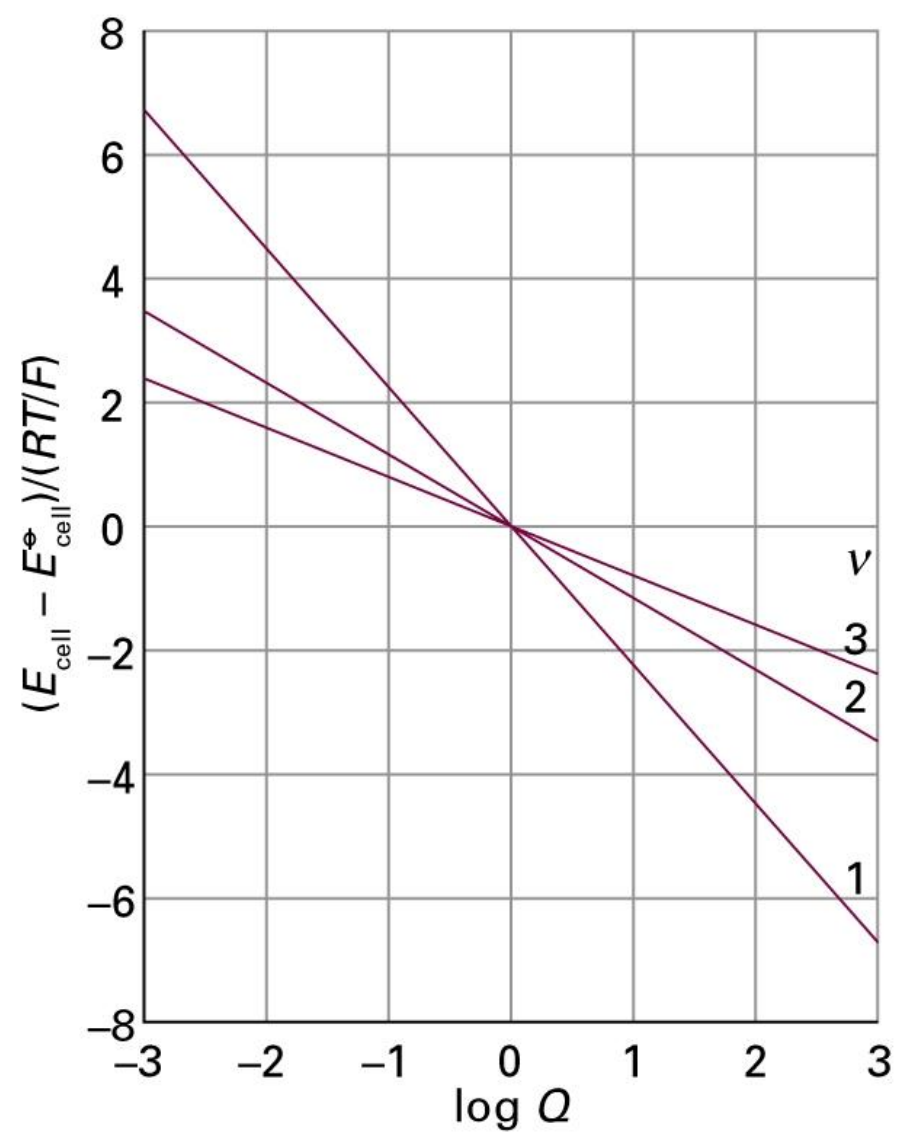


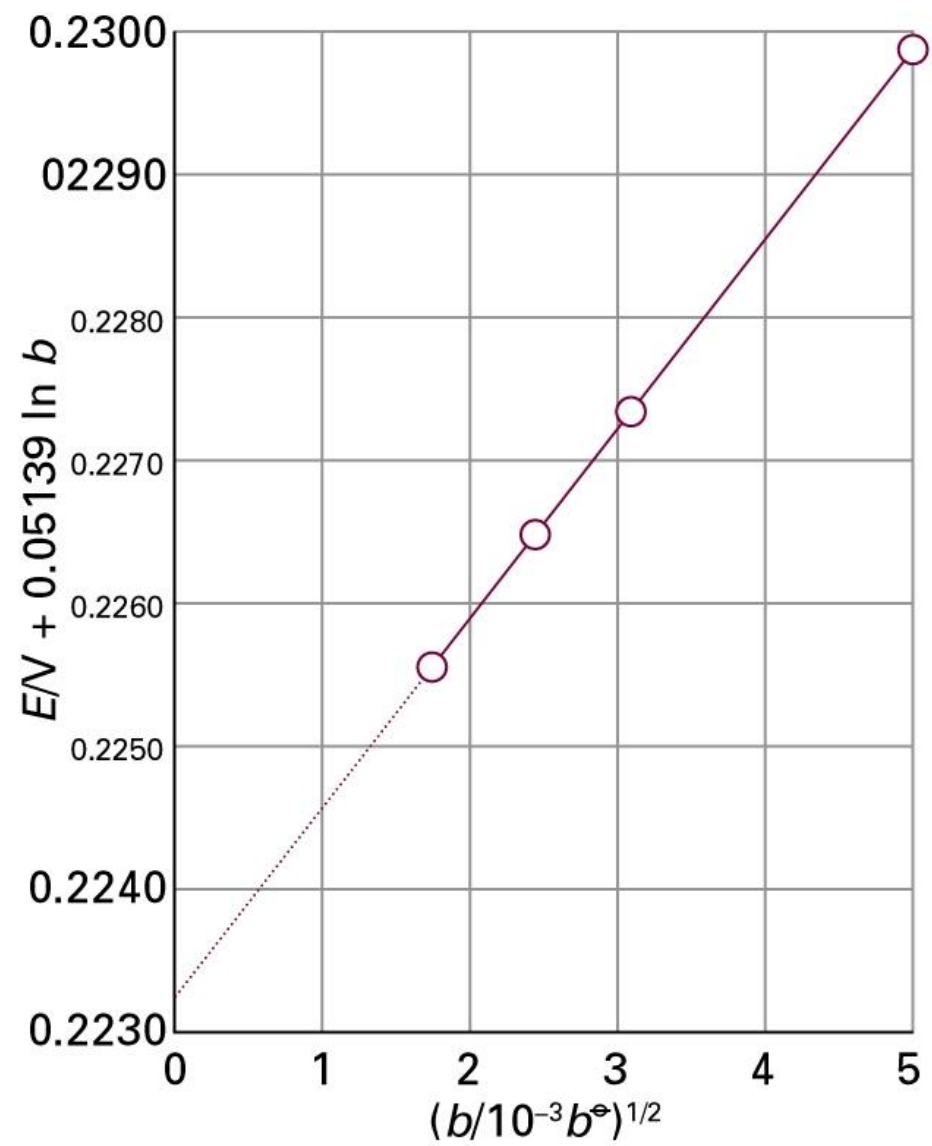












**Table 6.2\*** Standard potentials at 298 K

Couple	$E^\ominus/\text{V}$
$\text{Ce}^{4+}(\text{aq}) + \text{e}^- \rightarrow \text{Ce}^{3+}(\text{aq})$	+1.61
$\text{Cu}^{2+}(\text{aq}) + 2 \text{e}^- \rightarrow \text{Cu}(\text{s})$	+0.34
$\text{H}(\text{aq}) + \text{e}^- \rightarrow \frac{1}{2} \text{H}_2(\text{g})$	0
$\text{AgCl}(\text{s}) + \text{e}^- \rightarrow \text{Ag}(\text{s}) + \text{Cl}^-(\text{aq})$	+0.22
$\text{Zn}^{2+}(\text{aq}) + 2 \text{e}^- \rightarrow \text{Zn}(\text{s})$	-0.76
$\text{Na}^+(\text{aq}) + \text{e}^- \rightarrow \text{Na}(\text{s})$	-2.71

\* More values are given in the *Data section*.

**Table 6.3** The electrochemical series of the metals\*

---

*Least strongly reducing*

Gold

Platinum

Silver

Mercury

Copper

(Hydrogen)

Lead

Tin

Nickel

Iron

Zinc

Chromium

Aluminium

Magnesium

Sodium

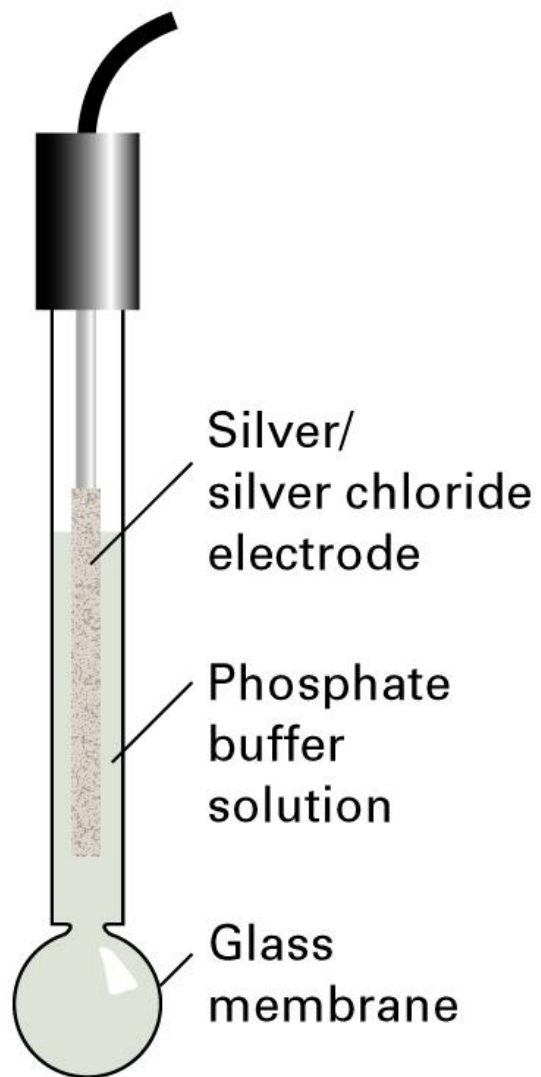
Calcium

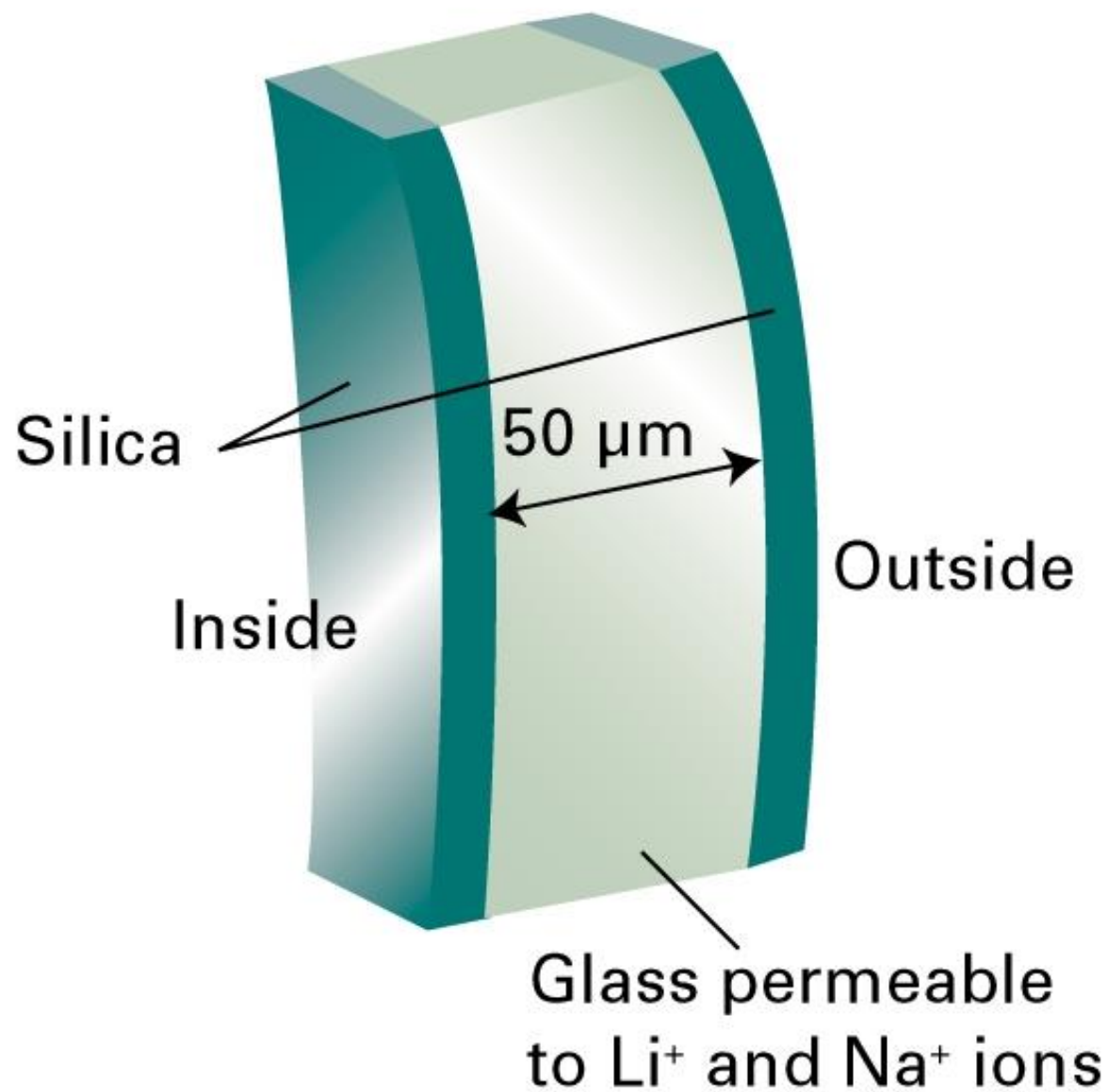
Potassium

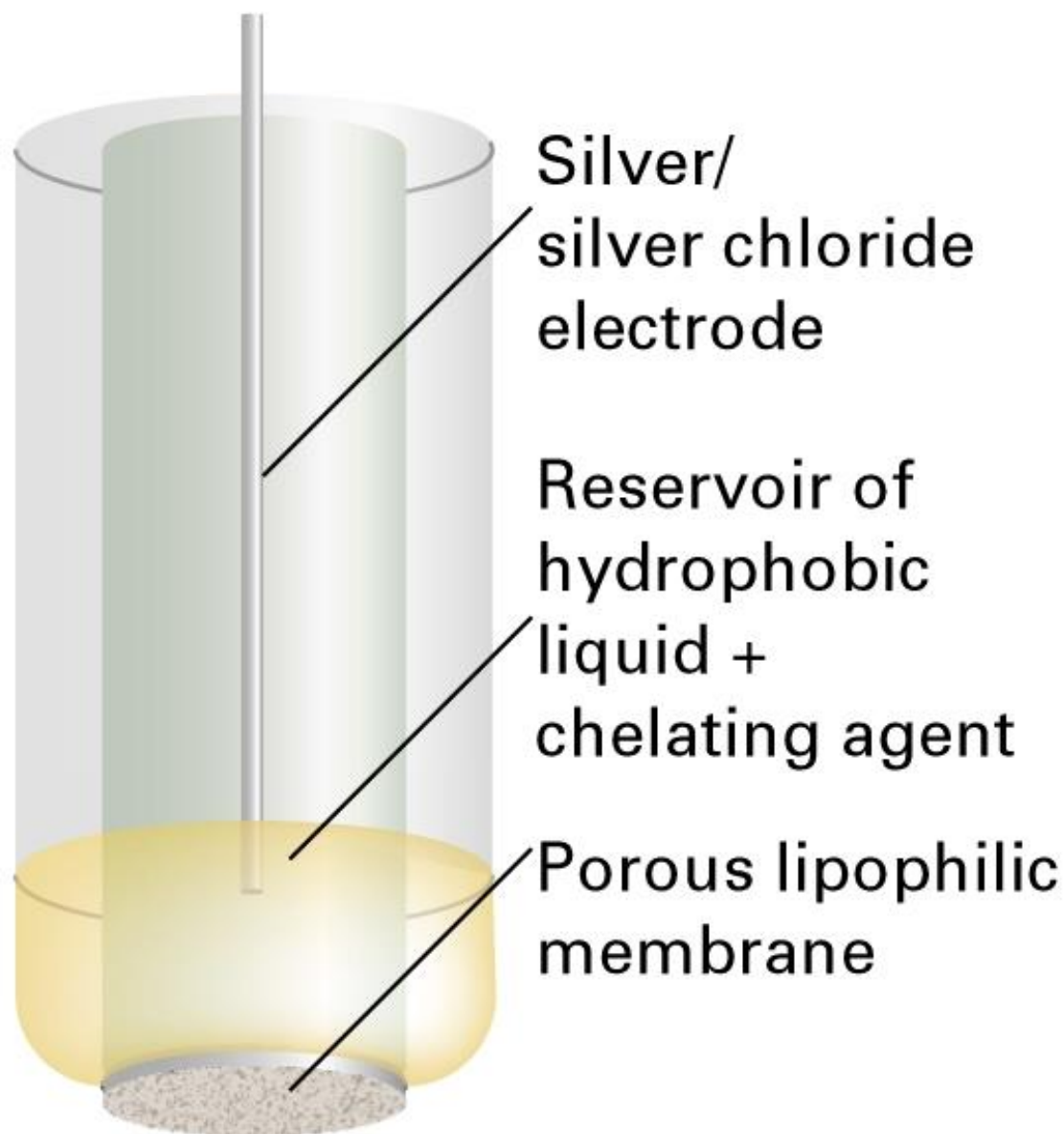
*Most strongly reducing*

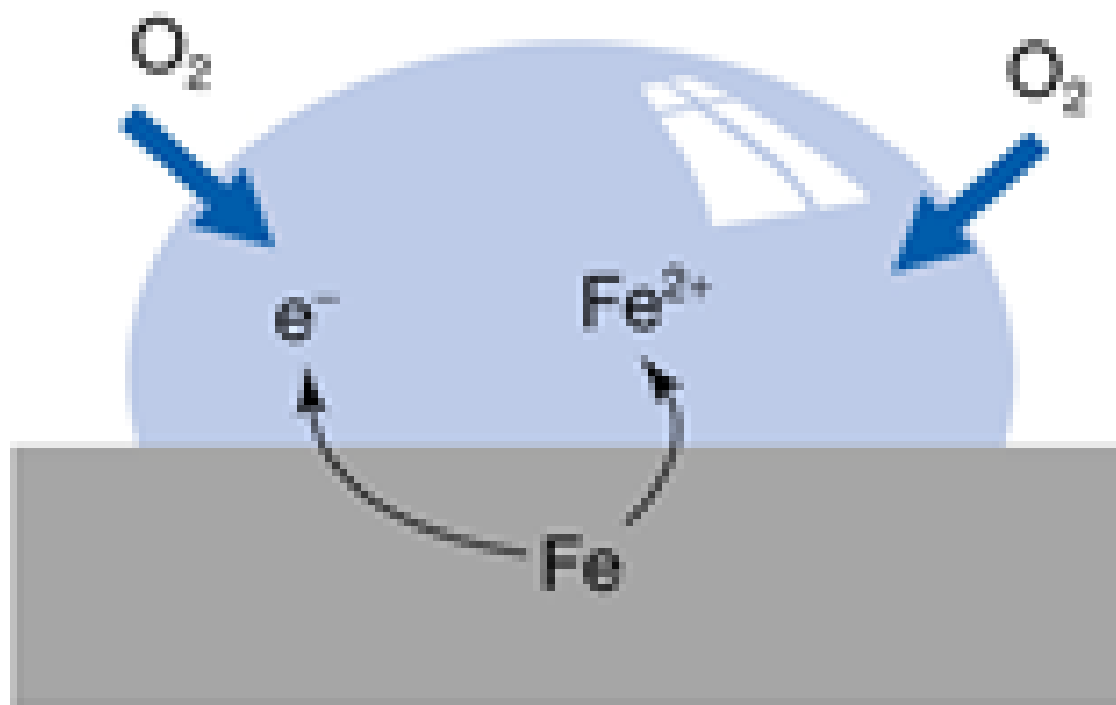
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\* The complete series can be inferred from Table 6.2.

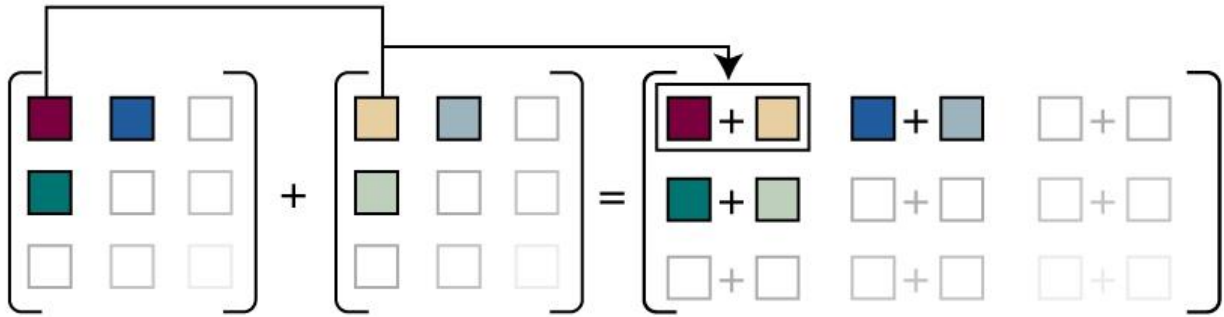




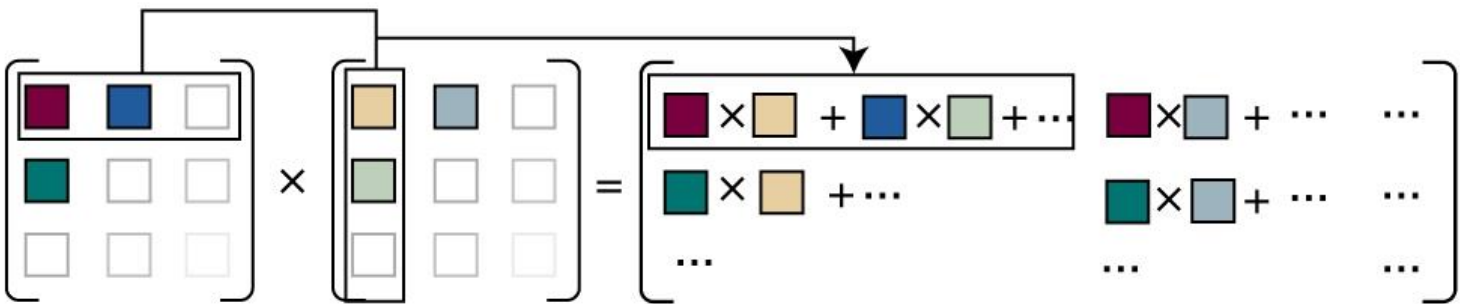








(a)



(b)