

Chapter 17 — Problem Set 3

Michael Brodskiy

Instructor: Mr. Morgan

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1. (a)

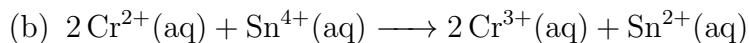
$$\begin{aligned} E^0 &= .141 + .799 = .94[\text{V}] \\ -(2) (9.648 \cdot 10^4) (.94) &= -181.4[\text{kJ}] \end{aligned} \tag{1}$$

(b)

$$\begin{aligned} E^0 &= 1.229 - .534 = .695[\text{V}] \\ -(2) (9.648 \cdot 10^4) (.695) &= -134.1[\text{kJ}] \end{aligned} \tag{2}$$

2. (a)

$$\begin{aligned} E^0 &= -.547 - .004 = -.551[\text{V}] \\ \ln(K) &= \frac{(-.551)(2)}{.0257} = -42.88 \\ e^{-42.88} &= 2.39 \cdot 10^{-19} \end{aligned} \tag{3}$$



$$\begin{aligned} E^0 &= .408 + .154 = .562[\text{V}] \\ \ln(K) &= \frac{(.267)(2)}{.0257} = 43.74 \\ e^{43.74} &= 9.86 \cdot 10^{18} \end{aligned} \tag{4}$$

3.

$$\begin{aligned} E^0 &= -1.33 + 1.36 = .03[\text{V}] \\ Q &= [\text{H}^+]^{14} = (.126)^{14} = 2.51 \cdot 10^{-13} \\ E &= .03 - \frac{.0257}{6} \ln(2.51 \cdot 10^{-13}) \\ &= .154[\text{V}] \end{aligned} \tag{5}$$

4.

$$\begin{aligned} \text{Ag} &= 108 \left[\frac{\text{g}}{\text{mol}} \right] \\ \left(\frac{1}{10.5 \cdot 6.25} \right) (108) \left(\frac{1}{9.648 \cdot 10^4} \right) (2) (8700) &= .297 [\text{cm}] \end{aligned} \tag{6}$$