

Unit 5 – Chapter 16: Electrochemistry

Name _____

Assignment #4: Voltaic Cells & Nernst Equation

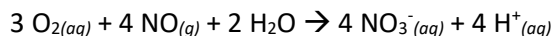
Period _____

- 1) Consider a voltaic cell at 25°C in which the following reaction takes place.



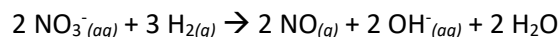
- Calculate E^0 .
- Write the Nernst equation for the cell.
- Calculate E when $[\text{Au}^{3+}] = 0.250 \text{ M}$, $[\text{H}^+] = 1.25 \text{ M}$, $[\text{H}_2\text{O}_2] = 1.50 \text{ M}$.

- 2) Consider a voltaic cell at 25°C in which the following reaction takes place.



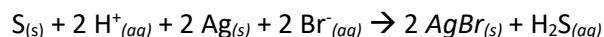
- Calculate E^0 .
- Write the Nernst equation for the cell.
- Calculate E when $[\text{NO}_3^-] = 0.750 \text{ M}$, $P_{\text{NO}} = 0.993 \text{ atm}$, $P_{\text{O}_2} = 0.515 \text{ atm}$, $\text{pH} = 2.85$.

- 3) Consider a voltaic cell in which the following reaction takes place.



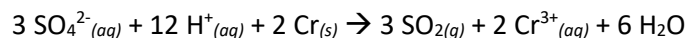
- Calculate E^0 .
- Write the Nernst equation for the cell.
- Calculate E when $[\text{NO}_3^-] = 0.0315 \text{ M}$, $P_{\text{NO}} = 0.922 \text{ atm}$, $P_{\text{H}_2} = 0.437 \text{ atm}$, $\text{pH} = 11.50$.

- 4) Consider the reaction



At what pH is the *voltage* zero if all other species are at standard concentrations?

- 5) Consider the reaction below at 25°C:



Use table 18.1 to answer the following questions. Support your answers with calculations.

- Is the reaction spontaneous at standard conditions?
- Is the reaction spontaneous at a pH of 3.00 with all other ionic species at 0.100 M and gases at 1.00 atm?
- At what pH is the reaction at equilibrium with all other ionic species at 0.100 M and gases at 1.00 atm?