***Chemistry***

**17: Electrochemistry**

**17.4: The Nernst Equation**

29. For the standard cell potentials given, determine the Δ*G*° for the cell in kJ.

(a) 0.000 V, n = 2

(b) +0.434 V, n = 2

(c) –2.439 V, n = 1

Solution



(a) 

(b) 

(c) 

31. Determine the standard cell potential and the cell potential under the stated conditions for the electrochemical reactions described. State whether each is spontaneous or nonspontaneous under each set of conditions at 298.15 K.

(a) 

(b) The galvanic cell made from a half-cell consisting of an aluminum electrode in 0.015 *M* aluminum nitrate solution and a half-cell consisting of a nickel electrode in 0.25 *M* nickel(II) nitrate solution.

(c) The cell made of a half-cell in which 1.0 *M* aqueous bromine is oxidized to 0.11 *M* bromide ion and a half-cell in which aluminum ion at 0.023 *M* is reduced to aluminum metal. Assume the standard reduction potential for Br2(*l*) is the same as that of Br2(*aq*).

Solution

All reactions are at 298.15 K and use:

(a) 

(b)



(c) Oxidation occurs at the anode and reduction at the cathode.



33. Use the data in Appendix L to determine the equilibrium constant for the following reactions. Assume 298.15 K if no temperature is given.

(a) 

(b) 

(c) 

(d) 

Solution

All use  with 

(a)



(b)



(c)



(d)



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