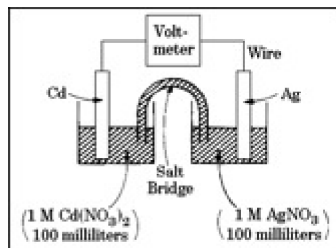


## ELECTROCHEM PRACTICE

### Multiple Choice

Identify the choice that best completes the statement or answers the question.



The spontaneous reaction that occurs when the cell above operates is:  $2\text{Ag}^+ + \text{Cd}(s) \rightarrow 2\text{Ag}(s) + \text{Cd}^{2+}$

- A 50-milliliter sample of a 2-molar  $\text{Cd}(\text{NO}_3)_2$  solution is added to the left beaker. Which of the following occurs given the cell above?
  - Voltage increases.
  - Voltage decreases but remains at zero.
  - Voltage becomes zero and remains at zero.
  - No change in voltage occurs.
  - Direction of voltage change cannot be predicted without additional information.
- The salt bridge is replaced by a platinum wire. Which of the following occurs given the cell above?
  - Voltage increases.
  - Voltage decreases but remains at zero.
  - Voltage becomes zero and remains at zero.
  - No change in voltage occurs.
  - Direction of voltage change cannot be predicted without additional information.
- $\text{Cu}(s) + 2\text{Ag}^+ \rightarrow \text{Cu}^{2+} + 2\text{Ag}(s)$  If the equilibrium constant for the reaction above is  $3.7 \times 10^{15}$ , which of the following correctly describes the standard voltage,  $E^\circ$ , and the standard free energy change,  $\Delta G^\circ$ , for this reaction?
  - $E^\circ$  is positive and  $\Delta G^\circ$  is negative
  - $E^\circ$  is negative and  $\Delta G^\circ$  is positive
  - $E^\circ$  and  $\Delta G^\circ$  are both positive
  - $E^\circ$  and  $\Delta G^\circ$  are both negative
  - $E^\circ$  and  $\Delta G^\circ$  are both zero
- If 0.060 faraday is passed through an electrolytic cell containing a solution of  $\text{In}^{3+}$  ions, the maximum number of moles of In that could be deposited at the cathode is
  - 0.010 mol
  - 0.020 mol
  - 0.030 mol
  - 0.060 mol
  - 0.18 mol
- $\text{NH}_3(g) + 2\text{CH}_4(g) + 5/2\text{O}_2(g) \rightleftharpoons \text{H}_2\text{NCH}_2\text{COOH}(s) + 3\text{H}_2\text{O}(l)$   
At constant temperature,  $\Delta H$ , the change in enthalpy for the reaction above is approximately equal to
  - $\Delta E - (11/2)RT$
  - $\Delta E - (7/2)RT$
  - $\Delta E + RT$
  - $\Delta E + (7/2)RT$
  - $\Delta E(11/2)RT$
- A copper sample containing zinc impurity is purified by electrolysis, the anode and cathode must be which of the following?

| Anode                   | Cathode              |
|-------------------------|----------------------|
| a. pure copper          | pure zinc            |
| b. pure zinc            | pure copper          |
| c. pure copper          | impure copper sample |
| d. impure copper sample | pure copper          |
| e. impure copper sample | pure zinc            |