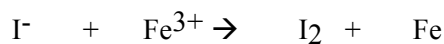


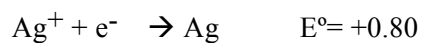
1. What is the oxidation number for N in $\text{Al}(\text{NO}_3)_3$?
- a. 2 b. 3 c. 4 d. 5 e. 6
2. Balance the following reaction. How many electrons are transferred in the balanced reaction?



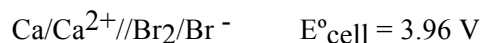
- a. 1
b. 2
c. 4
d. 6
e. none of the above
3. For the following balance reaction, which of the following statements is **NOT TRUE**.



- a. The carbon in CO is oxidized
b. The iodine in I_2O_5 is reduced
c. CO is the reducing agent
d. I_2O_5 is the reducing agent
e. none of the above
4. Which of the following statements is **true** for the spontaneous, favorable reaction involving the following half-reactions (one of which needs to be reversed).



- a. Ni is the anode; $E^\circ_{\text{cell}} = -0.55 \text{ V}$
b. Ni is the anode; $E^\circ_{\text{cell}} = +1.05 \text{ V}$
c. Ni is the cathode; $E^\circ_{\text{cell}} = -1.05 \text{ V}$
d. Cu is the cathode; $E^\circ_{\text{cell}} = +1.85 \text{ V}$
e. none of the above
5. If the standard reduction potential of calcium is -2.87 V , what is the standard reduction potential of bromine, given the following:



- a. 0.55 V
b. -0.55 V
c. 1.09 V
d. 2.36 V
e. none of the above

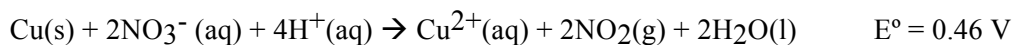
6. Given the following ions and their reduction potentials, **which of the following ions will react with Fe metal?** Al^{3+} (-2.36 V); Fe^{2+} (-0.44 V); Ni^{2+} (-0.25 V); Cu^{2+} (+0.34 V).

- a. Al^{3+} only
- b. Al^{3+} , Ni^{2+} , and Cu^{2+} will all react
- c. Cu^{2+} only
- d. Ni^{2+} and Cu^{2+} will react, but not Al^{3+}

7. What is ΔG° for the following: $2\text{Al} + 3\text{Cl}_2 \rightarrow 2\text{AlCl}_3$ $E^\circ = 3.02 \text{ V}$

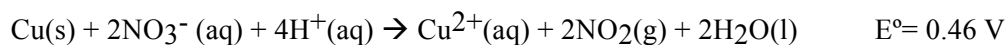
- a. -1750 kJ
- b. -1250 kJ
- c. -874 kJ
- d. 1310 kJ
- e. none of the above

8. What is **E (actual)** for the following reaction, if $[\text{H}^+] = 0.015 \text{ M}$ and all of the other reactants and products are in standard states/concentrations.



- a. 0.70 V
- b. 0.24 V
- c. 0.68 V
- d. 0.57 V
- e. none of the above

9. What is the value of K for the reaction



- a. 5.9×10^7
- b. 1.2×10^{-31}
- c. 3.5×10^{15}
- d. 16
- e. 1.2

10. How many grams of silver metal Ag (107.87 g/mol) can be made from Ag^+ by $2.50 \times 10^4 \text{ C}$ of charge?

- a. 28.0 g
- b. 14.0 g
- c. 56.0 g
- d. 0.250 g
- e. none of the above