

Non Sibi High School

Andover's Chem 250: Introductory/Basic Chemistry

Chapter 16, Review Quiz 1

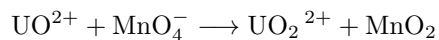
1

Determine all oxidation numbers in:

- a. As^{3-}
- b. F_2
- c. HO_2^-
- d. IO_4^-
- e. KH

2

Determine all oxidation numbers, identify the reducing agent and oxidizing agent, and balance the following equation that occurs in aqueous acidic solution using the smallest possible whole-number coefficients:



3

Rank the solid alkali metals K, Li, and Na from weakest to strongest reducing agent under standard conditions. Justify your answer using a table of standard reduction potentials.

4

Rank the aqueous cations Ag^+ , Al^{3+} , and Cd^{2+} from weakest to strongest oxidizing agent under standard conditions. Justify your answer using a table of standard reduction potentials.

5

For each spontaneous reaction below, calculate E_{cell}° and then balance the equation.

- chlorine gas + aqueous potassium bromide
- solid aluminum metal + aqueous hydrochloric acid
- solid gold metal + aqueous nitric acid
- solid zinc metal + aqueous cadmium(II) nitrate

6

A galvanic cell was constructed using a strip of nickel metal and a strip of aluminum metal, a 1 M solution of NiSO_4 and a 1 M solution of $\text{Al}(\text{NO}_3)_3$, and an aqueous solution of NaNO_3 in the salt bridge. For the spontaneous reaction that occurred, calculate E_{cell}° and ΔG° , then balance the equation. Also sketch the galvanic cell.

7

Calculate the minimum voltage required to bring about the reaction $\text{Cr}^{3+}(\text{aq}) + \text{Ag}(\text{s}) \longrightarrow \text{Cr}(\text{s}) + \text{Ag}^+(\text{aq})$ by electrolysis under standard conditions, then balance the equation.

8

For the electrolysis of molten NaI , write the half-reaction that occurs at the anode and the half-reaction that occurs at the cathode, then balance the equation.



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