**Pretest 3.3 Part 1**

1.      TRUE? Or FALSE?

a)      Each hydrogen in NaH and HCl has an oxidation number of +1.
b)      To calculate the oxidation numbers of the atoms in a polyatomic ion, the charge of the ion must be used.
c)      The oxygen in $H_2O$ has an oxidation number of $-2$.
d)      The oxidation number for nitrogen in a molecule is always +5.
e)      $A + e \rightarrow A^{-1}$ is a reduction

2.      Determine the oxidation number for each atom in the following molecules and calculate the total contribution by the atom.

a)      $AlCl_3$
b)      $OCl^-$
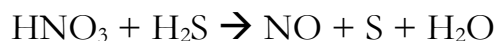c)      $Mg^{+2}$
d)      $KClO_3$

3.      Given the unbalanced equation:

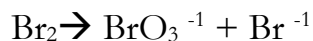        $FeCl_3 + SnCl_2 \rightarrow SnCl_4 + FeCl_2$

a)      Identify what is being oxidized and what is being reduced.
b)      Write the two half-reactions

4.      Given the unbalanced equation:

        $HNO_3 + H_2S \rightarrow NO + S + H_2O$

        Identify what is being oxidized and what is being reduced.

5.      Given the unbalanced equation:

        $Br_2 \rightarrow BrO_3^{-1} + Br^{-1}$

        Identify what is being oxidized and what is being reduced.

6.    a)    Write two half reactions for the following:
            $3 \text{ Zn} + 2 \text{ Au}^{+3} \rightarrow 2 \text{ Au} + 3 \text{ Zn}^{+2}$.
      b)    Which would serve as the anode in an electrochemical cell?
      c)    Which substance would be the oxidizing agent?
      d)    What ionic component would complete the circuit while
      maintaining the voltage?
      e)    Why are Zn, Ca and Mg all good reducing agents?

      f)    If the bridge had KCl which ion would move towards the gold
      electrode and which electrode would gain mass?


7.    Balance the following redox reaction occurring in a **basic** solution by
      means of the half reaction method.          $S^{-2} + NO_3^{-1} \rightarrow NO_2 +$
      $SO_2$

8.    Balance the following redox reaction occurring in **an acidic** solution by
      means of the half reaction method.
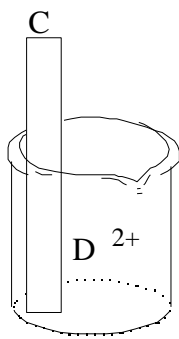
$$HNO_3 + H_2S \rightarrow NO + S + H_2O$$


    9.
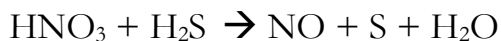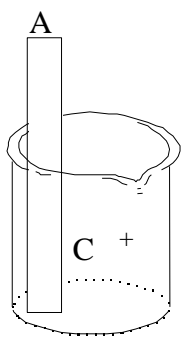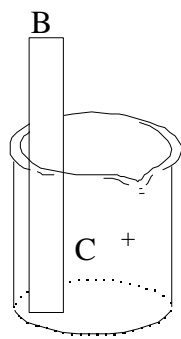
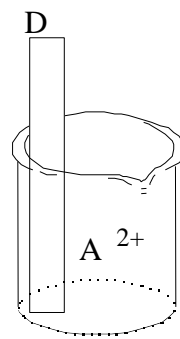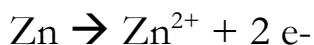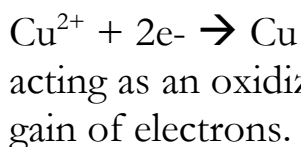| A | B | C | D |
|---|---|---|---|
| $C^+$ | $C^+$ | $D^{2+}$ | $A^{2+}$ |
| 1.No reaction | 2. Reaction | 3. Reaction | 4. No reaction |

Which of the above metals is the strongest reducing agent? Rank them all from strongest to weakest. Do likewise for reducing agents.

The reducing agent (the rabbit) gives up electrons, causes someone else to experience a GER, but in doing so, the rabbit itself does a LEO.

$Zn \rightarrow Zn^{2+} + 2$ e-

Zn is a rabbit and a reducing agent undergoing a loss of electrons.

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An oxidizing agent steals electrons, causing someone else to get oxidized, so the oxidizing agent's oxidation number is itself reduced. The oxidizing agent does a GER.

GER

$Cu^{2+} + 2e- \rightarrow Cu$        Here $Cu^{2+}$ is acting as an oxidizing agent, undergoing a gain of electrons.