**Lesson Quiz – Oxidation/Reduction**

*Multiple Choice:*

1. An example of an oxidation process is
   1. removal of oxygen
   2. reacting Fe2O3 with carbon
   3. heating mercuric oxide
   4. bleaching stains
2. An example of a reduction process is
   1. formation of MgO
   2. killing bacteria with H2O2
   3. refining iron ore
   4. rusting of iron
3. One metal that does not corrode easily is
   1. Fe
   2. Sn
   3. Au
   4. Mn
4. When O is reduced
   1. electrons are added to the O atom
   2. electrons are removed from the O atom
   3. electrons are transferred to another atom
   4. electrons are lost in the solution
5. The reduction process involves
   1. gain of oxygen
   2. loss of electrons
   3. gain of hydrogen
   4. increase in oxidation number
6. The oxidation process involves
   1. gain of hydrogen
   2. gain of oxygen
   3. gain of electrons
   4. decrease in oxidation number
7. One element for which there are no specific oxidation number rules is
   1. Na
   2. Ne
   3. S
   4. Ca
8. Br can have all of the following oxidation numbers except
   1. -1
   2. -2
   3. +3
   4. +5
9. The oxidation number for S in H2SO3 is
   1. -2
   2. -4
   3. +2
   4. +4
10. In the reaction 2KClO3 → 2KCl + 3O2 , the oxidation change was
    1. Cl− → Cl+5
    2. O2− → O0
    3. Cl+3 → Cl−
    4. Cl+5 → Cl+3

*True/False:*

1. \_\_\_\_\_ When N2O3 changes to N2O5, the N has been oxidized
2. \_\_\_\_\_ The oxidation number for N in N2F4 is +3.
3. \_\_\_\_\_ Double-displacement reactions are redox reactions.
4. \_\_\_\_\_ O can have an oxidation number of -1 in some circumstances.
5. \_\_\_\_\_ O in the water molecule is less electron-rich than the H is.
6. \_\_\_\_\_ Net ionic equations eliminate spectator ions.
7. \_\_\_\_\_ Copper oxide reacts with CO2 to form patina.
8. \_\_\_\_\_ The half-reaction Fe2+ → Fe3+ represents a reduction process.
9. \_\_\_\_\_ All oxidation reactions involve oxygen.
10. \_\_\_\_\_ A sacrificial metal helps prevent another metal from corrosion.

*Fill in the Blank:*

1. Define the following terms:
   1. oxidation-reduction reaction
   2. half-reaction
   3. corrosion
   4. oxidation number
2. Determine the oxidation number of the indicated element in each of the following compounds:

|  |  |  |
| --- | --- | --- |
| **Atom** | **Compound** | **Oxidation Number** |
| C | H2CO3 |  |
| Zn | Zn(OH)42- |  |
| H | LiH |  |
| Fe | Fe2O3 |  |

1. For each of the following reactions, identify the entity that was oxidized and the entity that was reduced. Indicate the oxidizing and reducing agents:
   1. 2Fe(OH)2 + H2O2 → 2Fe(OH)3
   2. 2Cr3+ + H2O + 6ClO3− → Cr2O72− + 6ClO2 + 2H +
   3. I2O5 + 5CO → I2 + 5CO2
2. Predict the products of the following reaction and write balanced equations:
   1. CuO + H2 →
   2. KBr + Cl2 →
   3. Fe + CuSO4 →
3. Balance the following equations:
4. MnO4− + I − → IO3− + Mn2+ under acid conditions.
5. S2O23− + H2O2 → S4O26− + H2O under acid conditions