**VIRTUAL LAB Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**METALS IN AQUEOUS SOLUTIONS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Google – metals in aqueous solutions or type in:**

<http://www.chem.iastate.edu/group/Greenbowe/sections/projectfolder/flashfiles/redox/home.html>

**Introduction: Click on the beakers and observe the ions in the solutions**

1. What ions do you see in the Mg(NO3)2 solution? Mg2+ and NO3-

How many of each ion are present?

2. What ions do you see in the AgNO3 solution?

How many of each ion are present?

3. What ions do you see in the Zn(NO3)2 solution?

How many of each ion are present?

Use the data tables below to record your observations. Include colors of solutions, whether the metal gets atoms added or removed from it. If nothing happens write NR for no reaction.

**Activity 1: Look at the large scale first to get observations. Then click on the molecular scale reactions to see what actually happens to the ions.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Mg(NO3)2 | Zn(NO3)2 | Cu(NO3)2 | AgNO3 |
| Mg |  |  |  |  |
| Cu |  |  |  |  |
| Zn |  |  |  |  |
| Ag |  |  |  |  |

For at least one reaction, write an explanation of what you saw happen at the molecular level:

**Activity 2: Look at the large scale first to get observations. Then click on the molecular scale reactions to see what actually happens to the ions.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Fe(NO3)2 | Zn(NO3)2 | Cu(NO3)2 | Pb(NO3)2 |
| Fe |  |  |  |  |
| Cu |  |  |  |  |
| Zn |  |  |  |  |
| Pb |  |  |  |  |

For at least one reaction, write an explanation of what you saw happen at the molecular level:

**Activity 3: Look at the large scale first to get observations. Then click on the molecular scale reactions to see what actually happens to the ions.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Fe(NO3)2 | Pb(NO3)2 | Ni(NO3)2 | Sn(NO3)2 |
| Fe |  |  |  |  |
| Pb |  |  |  |  |
| Ni |  |  |  |  |
| Sn |  |  |  |  |

For at least one reaction, write an explanation of what you saw happen at the molecular level:

**Activity 4: Record your observations for each test of the metal in hydrochloric acid. For at least 1, record what happened at the molecular level.**

|  |  |
| --- | --- |
| Ag |  |
| Cu |  |
| Fe |  |
| Mg |  |
| Ni |  |
| Pb |  |
| Sn |  |
| Zn |  |

**Conclusion**

1. List the metals in order from most reactive to least reactive.

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Most Reactive Least Reactive

1. Write the balanced chemical equation for the single replacement reaction between Cu+2 & AgNO3
2. What evidences would you see that indicates a chemical change has taken place? List at least 2.