**5.10 HONORS CLASS WORKSHEET – DISPLACEMENT REACTIONS AND THE REACTIVITY SERIES**

**Note: most d-block metals form ions with a 2+ charge (eg Zn2+, Cu2+, Fe2+, Co2+, Ni2+)**

 **Some of them can also form ions with a 3+ charge (eg Fe3+)**

**Silver is an exception, it only forms Ag+ ions**

**Group 4 metals like Sn and Pb also usually form ions with a 2+ charge (eg Pb2+, Sn2+)**

**Carbon can form CO or CO2**

1. **The following reactions all take place.**

Complete and balance them, identify the atom or ion oxidized or reduced, identify the spectator ion and deduce which of the elements is more reactive:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Equation | oxidized | reduced | spectator |
| (a) | Equation: | CuSO4 + Zn 🡪 ZnSO4 + Cu | Zn | Cu2+ | SO42- |
| Conclusion: | Zn is more reactive than Cu |
| (b) | Equation: | ZnCl2 + Mg 🡪  |  |  |  |
| Conclusion: |  |
| (c) | Equation: | Fe2O3 + 2Al 🡪 |  |  |  |
| Conclusion: |  |
| (d) | Equation: | Ni + H2SO4 🡪 |  |  |  |
| Conclusion: |  |
| (e) | Equation: | Cu + 2AgNO3 🡪 |  |  |  |
| Conclusion: |  |
| (f) | Equation: | 2PbO + C 🡪 |  |  |  |
| Conclusion: |  |
| (g) | Equation: | Cl2 + 2KI 🡪  |  |  |  |
| Conclusion: |  |

1. **Some of the following reactions do take place, others don’t.**

Predict whether or not a reaction will take place; complete the reaction if it takes place; and explain your answer:

|  |  |  |
| --- | --- | --- |
|  | Equation | Reason |
| (a) | Mg + 2HCl 🡪 MgCl2 + H2 | Mg is more reactive than H |
| (b) | Cu + ZnSO4 🡪 no reaction | Cu is less reactive than Zn |
| (c) | FeCl2 + Zn 🡪 |  |
| (d) | Ag + H2SO4 🡪 |  |
| (e) | Fe2O3 + 3C 🡪  |  |
| (f) | CuO + H2 🡪 |  |
| (g) | I2 + 2NaBr 🡪 |  |