**PRACTICAL 18 – ELECTROCHEMICAL CELLS**

1. Set up half-cells for each of the following electrode reactions:

Cu2+(aq) + 2e == Cu(s)

Fe2+(aq) + 2e == Fe(s)

Al3+(aq) + 3e == Al(s)

Mg2+(aq) + 2e == Mg(s)

Zn2+(aq) + 2e == Zn(s)

Fe3+(aq) + 3e == Fe(s)

1. Use these half-cells to create five electrochemical cells. Choose five cells which allow you to rank all six half-cells from most positive to most negative. Make a note of the emf of each cell, including the sign.

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| --- | --- | --- |
| Right hand electrode | Left hand electrode | Emf of cell |
|  |  |  |
|  |  |  |
|  |  |  |
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1. Write equations for the chemical reaction taking place in each cell.
2. Given that the standard electrode potential for the Cu/Cu half-cell is +0.34V, deduce the standard electrode potentials of the other five half-cells.
3. Hence predict whether the following reactions are feasible:

2Al + 3Mg2+ 🡪 2Al3+ + 3Mg

Zn + Fe2+ 🡪 Zn2+ + Fe

Fe + 2Fe3+ 🡪 3Fe2+

Fe2+ + Cu 🡪 Fe + Cu2+

Al + Fe3+ 🡪 Al3+ + Fe

1. From the species in the half-cells above, choose:
2. The strongest oxidising agent
3. The weakest oxidising agent
4. The strongest reducing agent
5. The weakest reducing agent