**Name:**

**Period:**

**Voltage & Salt Bridge Cells**

**Part 1: Salt Bridge Cells**

1. For the galvanic cell shown on the right, give the ***balanced*** half-reactions:
	1. Oxidation:
	2. Reduction:
2. Write the overall reaction. (Make sure you add the half-reactions so that the electrons cancel out!)

**Cu+** 🡪 **Cu**

**Ni** 🡪 **Ni2+**

1. What is the overall electrochemical potential (voltage) for the cell shown on the right?
2. Using the electrochemical reaction given, fill in the blanks on the diagram to the right with the **appropriate letter** from the choices below.

Mn(s) + 2 Ag+ 🡪 Mn2+ + 2 Ag(s)

*Follow the “ABC” pattern explained in class.*

* 1. Oxidation
	2. Reduction
	3. Cathode

d

* 1. Anode
	2. Mn (s)
	3. Ag+ (aq)
	4. Mn2+ (aq)
	5. Ag (s)
	6. K+ into solution
	7. NO3- into solution
1. What is the overall cell potential (voltage) for this galvanic reaction?

**Part 2: Half reactions and voltage:**

For the following reactions:

* Divide the overall reaction given into half-reactions
1. Determine which is reduction (charge is reduced, electrons are gained).
2. Determine which is oxidation (charge is increased, electrons are lost).
* Balance each half-reaction. (Add the appropriate coefficients to balance atoms, then balance charge by adding an appropriate number of electrons where needed.)
* Find the voltage for each half-reaction as written. (This means changing the sign for the half-reaction written opposite from on your table of Standard Reduction Potentials.)
* Calculate the overall cell voltage.
* Determine whether or not the reaction is spontaneous. (Will it act as a galvanic cell?)

|  |  |
| --- | --- |
| 1. Zn(s) + Fe2+ -----> Zn2+ + Fe(s)
 | Eo (Voltage) |
| Reduction half-reaction: |  |
| Oxidation half-reaction: |  |
| Overall voltage: |  |
| Is this a spontaneous reaction? | Yes/No |
| 1. Br2(l) + 2Fe2+ -----> 2Br- + 2Fe3+
 | Eo (Voltage) |
| Reduction half-reaction: |  |
| Oxidation half-reaction: |  |
| Overall voltage: |  |
| Is this a spontaneous reaction? | Yes/No |
| 1. Ni2+ + 2Cl-(aq) -----> Ni(s) + Cl2(g)
 | Eo (Voltage) |
| Reduction half-reaction: |  |
| Oxidation half-reaction: |  |
| Overall voltage: |  |
| Is this a spontaneous reaction? | Yes/No |
| 1. H2(g) + Cr3+ 🡪 2H+ + Cr2+
 | Eo (Voltage) |
| Reduction half-reaction: |  |
| Oxidation half-reaction: |  |
| Overall voltage: |  |
| Is this a spontaneous reaction? | Yes/No |
| 1. 2 H2O(l) + Pb2+ 🡪 O2(g) + 4H+ + Pb(s)
 | Eo (Voltage) |
| Reduction half-reaction: |  |
| Oxidation half-reaction: |  |
| Overall voltage: |  |
| Is this a spontaneous reaction? | Yes/No |