Chemistry 12

Electrochemistry III

Name:
Date:
Block:

1. SRP Table

Standard Reduction Potential (SRP) Table

Similarly to BL-acids and bases, oxidizing and reducing agents vary in strengths as well.

Oxidizing Agents are REDUCED.
Its potential to be reduced is called its
_____ _____.

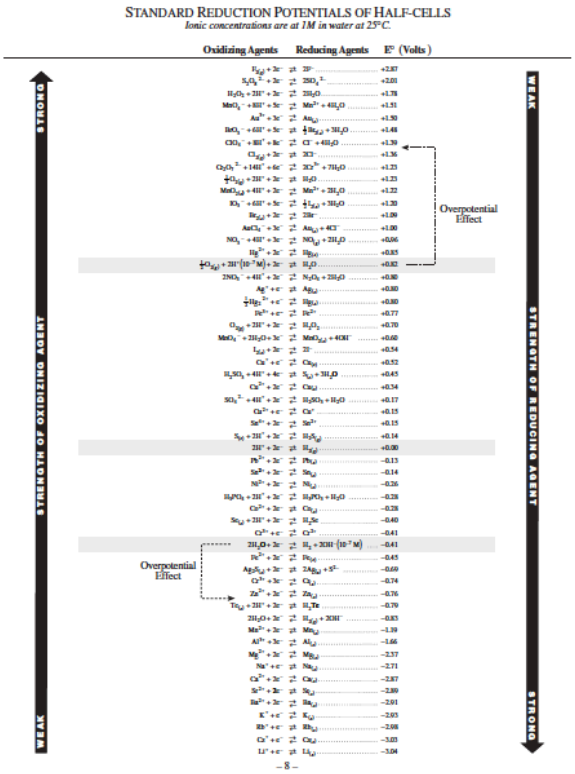
The table is read _____ to _____.

$$F_{2(g)} + 2e^- \rightleftarrows 2F^- \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad +2.87$$

Reducing Agents are OXIDIZED.
Its potential to be oxidized is called its
_____ _____.

The table is read _____ to _____.

$$F_{2(g)} + 2e^- \rightleftarrows 2F^- \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad +2.87$$



Example:

Strongest Reducing Agent:	Co	Sr	Al
Strongest Oxidizing Agent:	Fe^{3+}	Cu^{+}	Na^{+}
Greatest Reduction Potential:	Br^{-}	I^{-}	Sn^{4+}
Values:			
Greatest Oxidation Potential:	Cr^{3+}	Pb	Hg
Values:			

Consider the following (unbalanced) redox reaction

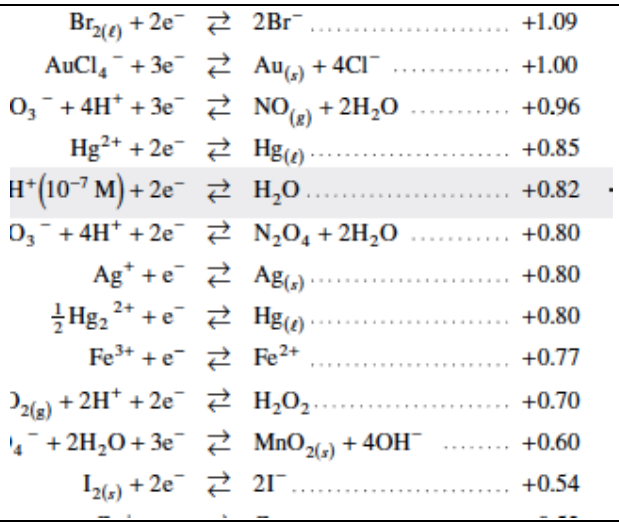
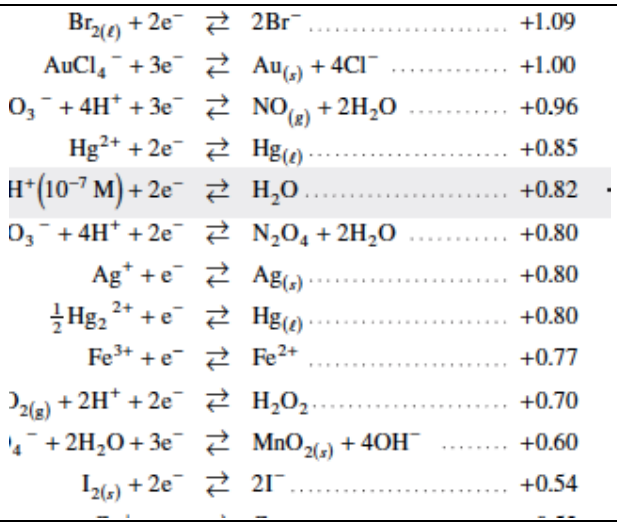
$$Ag^{+} + Al \rightarrow Ag + Al^{3+}$$

- Identify (and balance) the two half reactions:

  - ✓ *Note 1: Since "voltage" is the work done per electron, do not multiple the E^{o} value for the reduction of Ag^{+} by 3.*
  - ✓ *Note 2: If a half-reaction is reversed, the sign of its E^{o} value is also reversed.*

- What is the total cell potential? Is it spontaneous?

Spontaneous or non-spontaneous?

Br_2 and I^-	Br^- and I_2
Br_2 is a(n) _____ agent. Half reaction: I- is a(n) _____ agent. Half reaction: Which is higher on the table?	Br- is a(n) _____ agent. Half reaction: I_2 is a(n) _____ agent. Half reaction: Which is higher on the table?
	
Total Voltage:	Total Voltage:
Spontaneous or non-spontaneous?	*Spontaneous or non-spontaneous?*

When there are **more than two** chemicals available to react, the SRP table is used to predict which species will react.

T**he predominant redox reaction will be between:**

_____ and _____

Practice:

1. What will the predominant redox reaction be with a mixture of Cl_2, Ag^+, Sn^{2+} and I^-?

Oxidizing Agents

Reducing Agents

2. Sn^{4+}, Br^-, Zn^{2+} and Ag

Oxidizing Agents

Reducing Agents

3. $CuBr_2$ and Al

4. Na^{+}, Cu^{+} and F^{-}

5. Copper metal and bromine liquid in a solution of iron (III) iodide

6. I_2 and CaF_2

7. Al, Fe^{2+} and Cu^{2+}

8. Br_2 and NaCl

9. Sn and Al^{3+}

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For the following redox reactions, write each half reaction as a reduction:

$2\ A + G^{2+} \rightarrow 2\ A^{+} + G$

$T + 2V \rightarrow T^{2+} + 2\ V^{-}$

E^{+} oxidizes X to X^{2+}

Reorder the following reactions to produce an SRP table with five half-reactions.

$$U^{+} + e^{-} \rightarrow U$$
$$V^{+} + e^{-} \rightarrow V$$
$$W^{+} + e^{-} \rightarrow W$$
$$X^{+} + e^{-} \rightarrow X$$
$$Y^{+} + e^{-} \rightarrow Y$$

1. A solution of Y^{+} reacts spontaneously with V but not with U.
2. Solutions of U^{+}, V^{+}, Y^{+}, and X^{+} do not react spontaneously with W.
3. V+ reacts spontaneously with X.