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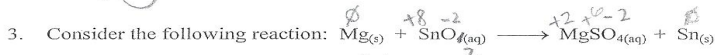
Honors Chemistry Worksheet: Electrochemistry

1.) From each pair, which is the better reducing agent?

- a.) Cd or Fe
- b.) Ca or Mg
- c.) Pb, Zn
- d.) Br-, Cu

2.) From each pair, which is the better oxidizing agent?

- a.) Ca<sup>2+</sup> or Li<sup>+</sup>
- b.) Fe<sup>3+</sup> or Hg<sub>2</sub><sup>2+</sup>
- c.) Cl<sub>2</sub> or Hg<sub>2</sub><sup>2+</sup>
- d.) Cu or Cu<sup>2+</sup>



- a.) Which species is oxidized? Mg
- b.) Which species is reduced? Sn
- c.) What is the oxidizing reagent? SnO<sub>2</sub>
- d.) What is the reducing reagent? Mg

4. How can a person prevent corrosion (oxidation) of a steel tank that must be kept outdoors?

Paint it. The paint is a barrier to prevent oxidation.

5. Exterior nails are coated with zinc (galvanized) to prevent oxidation of the iron nails. Why does this work?

The zinc easily becomes oxidized, which prevents the iron from oxidizing.

6. Describe the reactions that occurs at the anode and the cathode.

oxidation occurs at the anode. Reduction occurs at the cathode.

3.) Use Table of Standard Reduction Potentials to determine the voltage for the following cells:

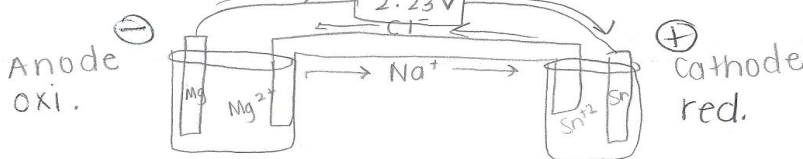
- a.) Zn|Zn<sup>2+</sup>||Fe<sup>2+</sup>|Fe .76 + -0.44 = .32 V
- b.) Mn|Mn<sup>2+</sup>||Fe<sup>2+</sup>|Fe 1.18 + -0.44 = .74 V
- c.) Al|Al<sup>3+</sup>||Ag|Ag<sup>+</sup> 1.66 + .80 = 2.46 V
- d.) Ni|Ni<sup>2+</sup>||Hg<sub>2</sub><sup>2+</sup>|Hg|Pt .25 + 0.79 = 1.04 V
- e.) Ag and Ag<sup>+</sup> with Au and Au<sup>3+</sup> .8 + 1.5 = .7 V
- f.) Pb and Pb<sup>2+</sup> with Cr<sup>2+</sup> and Cr -.13 + .91 = .78 V

4.) Voltaic Cells

a.) Draw a diagram of a Voltaic cell that corresponds to the following reaction:



$E^\circ = 2.37 + -.14$



$\begin{array}{r} 2.37 \\ - .14 \\ \hline 2.23 \end{array}$