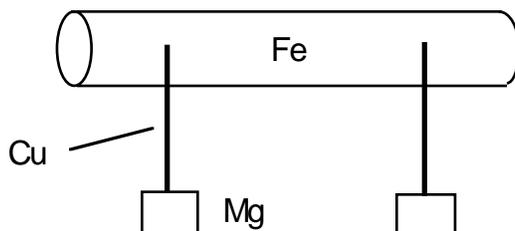


Chem12 Corrosion : Quiz - 90

- 1) What is corrosion?
- 2) What two compounds other than iron must be present before iron will corrode?
- 3) Explain why aluminum does not corrode as quickly as iron.
- 4) Which is more easily oxidized, Mn or Cr?
- 5) A steel can (mostly iron) is protected by coating it with zinc. Explain in detail how the zinc prevents corrosion.
- 6) An buried iron pipeline is protected by magnesium bars which are connected by a copper wire. Answer the following questions.



- a) The cathode is _____
- b) The anode is _____
- c) Give the anode reaction _____
- d) Give the cathode reaction _____
- e) Give the direction of electron flow in the copper wire.

f) Explain briefly how the iron is protected. Assume the copper wire doesn't react.

Answers : 1) It is the oxidation of a metal., 2) water and oxygen, 3) Aluminum forms an oxide coating that protects it from further oxidation., 4) Mn. It has a higher oxidation potential., 5) The zinc coating prevents water and oxygen and other oxidizers from coming in contact with the steel. The zinc itself is protected by an oxide coating. Also, if the zinc is scratched and the iron is exposed, the iron is still protected because the zinc will become a sacrificial anode., 6)a) Fe, b) Mg, c) $\text{Mg} \rightarrow \text{Mg}^{2+} + 2\text{e}^-$, d) $\text{O}_2 + 4\text{H}^+(10^{-7}\text{M}) + 4\text{e}^- \rightarrow 2\text{H}_2\text{O}$, e) Electrons flow from the Mg to the Fe., f) The set up shown is really an electrochemical cell, as water, ions and oxygen are usually present. The anode Mg, is more easily oxidized than the cathode Fe. As the Mg corrodes, electrons are donated to the Fe, so that the iron cannot be oxidized. Water is reduced at the surface of the iron. This is called cathodic protection.