

## Electrochemical Series

*Electrochemical or EMF series* is a list of metals and non metals. It is obtained when metals and non-metals are arranged as per their increasing standard reduction potential. The metals located at the top of the series are considered the most active, with the highest level of negative electrochemical potential. The metal that can be found at the bottom is the most noble and contains the highest amount of positive electrochemical potential.

It is observed that some metals like aluminum (Al) exhibits more noble (passive) behavior towards corrosion. But, this quality is going against what predicted by the electrochemical or EMF series. As per the EMF series, the standard oxidation potential of 'Al' is higher (+1.66 V) than that of 'Fe' (+0.44V), but Fe suffers from corrosion whereas 'Al' resists it. So, scientist thought of another series which could provide real and useful information about the corrosion of metals and alloys in a particular environment. This series is known as "*Galvanic Series*".

## Galvanic Series

Galvanic series is a list of metals and alloys which are arranged in a specific sequence as per their relative corrosion potential in a specific environment (usually sea water). In this series, there is no place for non-metals like chlorine, fluorine, etc.

*Galvanic Series: (Corrosion tendency decreases for Top to down)*

Mg (Anodic, active)

Mg alloys

Zn

Al

Cd

Mild steel

Cast Iron

Pb-Sn alloy

Pb

Sn

Brass

Cu

Ni

Stainless Steel

Cr

Ag

Ti

Au

Pt (Cathodic, noble)

Fig. 3. Galvanic series of some metals and alloys in sea water.

### Q. What is Galvanic series? What is its use?

Ans. Galvanic series is a list of metals and alloys which are arranged in a specific sequence as per their relative corrosion potential in a specific environment (usually sea water). It is very useful for studying the corrosion of metals and alloys.

#### *Differentiate between EMF series and Galvanic series*

Sl. No.	<i>EMF series</i>	<i>Galvanic series</i>
1	It is a list of metals and non-metals which are arranged in a specific sequence as per their relative standard Ox. Potential/Red. Potential.	It is a list of metals and alloys which are arranged in a specific sequence as per their relative corrosion potential in a specific environment (usually sea water).
2	The position of metals and non-metals are fixed in the series.	The position of metals and alloys are not fixed in the series. Position may change by changing the environment.
3	No place for alloys	No place for non-metals
4	It predicts the relative displacement tendencies. Not much helpful in studying corrosion tendency.	It is useful for studying the corrosion of metals and alloys.