

## Electrochemical Corrosion Behavior of New Developed Titanium Alloys in Ringer's Solution

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**Abstract :** Titanium alloys are known as highly bio compatible metallic materials due to their high strength, low elastic modulus, and high corrosion resistance in biological media. Besides other important material features, the corrosion parameters and corrosion products are responsible for limiting the biological and chemical bio compatibility of metallic materials that produce undesirable reactions in implant-adjacent and/or more distant tissues. Electrochemical corrosion behaviors of novel beta titanium alloys, Ti-4.7Mo-4.5Fe, Ti-3Mo-0.5Fe, and Ti-2Mo-0.5Fe were characterized in naturally aerated Ringer's solution at room temperature compared with common used biomedical titanium alloy, Ti-6Al-4V. The corrosion resistance of titanium alloys were investigated through open circuit potential (OCP), potentiodynamic polarization measurements and optical microscope (OM). A high corrosion resistance was obtained for all alloys due to the stable passive film formed on their surfaces. The new present alloys are promising metallic biomaterials for the future, owing to their very low elastic modulus and good corrosion resistance capabilities.

**Keywords :** titanium alloys, corrosion resistance, Ringer's solution, electrochemical corrosion

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