# Mechanical and Corrosion Behavior of Two High Entropy Alloys (HEA) for Medical Applications

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**Abstract**. A base alloy is designed, a high entropy multicomponent equiatomic alloy with pure elements (99.95%), formed by the Cr, Co, Fe, Mo and Ni system, LAS1, and from this alloy a new alloy is obtained by adding one more element, Zr, which we call LAS3. Both alloys were remelted by voltaic arc (VAR), to study the mechanical and corrosion behavior that allows us to consider its use as a medical material. One ingot of each alloy is produced by arc melting in an inert argon atmosphere and six remelting operations are performed on each of these alloys to ensure homogeneity. The modulus of elasticity E of each of these alloys is calculated by a three-point bending test. For this purpose, strands are cut from each of the samples and tested in an Electroforce_3100 machine applying a maximum load of 22 Newton. At least 10 tests are carried out with each of the alloys designed, the mean, $\bar{x}$ of the values obtained is calculated, as well as the standard deviation m. A linear polarization test is also carried out to calculate the corrosion rate. A BioLogic SP_150 potentiostat is used and for the electrochemical tests a 3.5 wt.% NaCl is employed. Beforehand, the samples are subjected to an open-circuit potential for 24 hours and also to Electrochemical Impedance Spectroscopy.

**Keywords**: high entropy alloy, corrosion, three-point flexion, arc melting.

**References:**

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