

An Experimental Investigation on Corrosion Rate of Mg Electrode Using an EQCN and Improvement in Anti Corrosion Rate of Mg Electrode by Surface Coating

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Abstract

Magnesium is essential constituent in human metabolism and is naturally found in bone tissue. The fracture toughness of magnesium is greater than ceramic biomaterials such as hydroxyapatite, furthermore elastic modulus and compressive yield strength of magnesium are closer to those of natural bone in comparison to other commonly used metallic implants. However, the major obstacle of Mg-based biomaterials has low corrosion resistance. In this study the surface of magnesium is coated with poly carpolactone (PCL) by two methods: by dipping magnesium in PCL solution and by electrospinning to enhance the corrosion resistance. Magnesium coated by dipping in polymer solution shows more resistance towards corrosion than coated by electrospinning. The corrosion rate for pure magnesium, electrospun coated and dipping coated magnesium is measured by Electronic Quarts Crystal Nanobalance (EQCN) and found to be 3.7ng, 0.6ng, 0.3ng per second respectively for 500 second.

References

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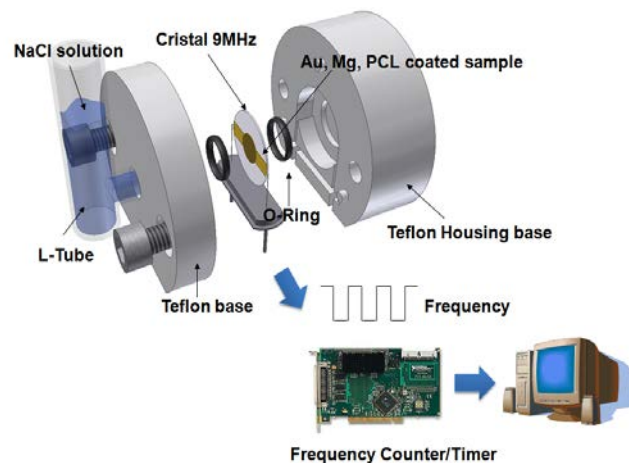


Fig.4 Sketch of the main test section of EQCN and Configuration of EQCN