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Study of the corrosion resistance of TiCN-coated PIM 316L in Hank's solution

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Powder injection moulding (PIM) is an attractive manufacturing route for stainless steels. The interest in this process is based on the capability of producing complex, near net shape components with similar mechanical properties when compared to wrought materials. Despite the widespread use of austenitic stainless steels as implants it is well known that these materials are prone to localized attack in the body fluids. PVD coatings such as TiN are often used to improve both corrosion resistance and biocompatibility of stainless steel implants. TiCN coatings present similar properties when compared to TiN. However, there is little information in the literature on the use of TiCN for biomedical applications. In this work, the corrosion resistance of TiCN-coated PIM 316L stainless steel was evaluated. The experimental techniques used were EIS and potentiodynamic polarization. SEM was used to assess the surface morphology of the coated specimens before and after immersion in Hank's solution.