

Title : Study of mechanical and corrosion resistance properties of plasma nitrided Ti-6Al-4V Alloy (TA)

Abstract

Among the biomedical implants TA is unique with high biocompatibility, corrosion resistance, and high specific strength. However, the tribological properties are not superior for this alloy. A plasma nitriding is a surface modification technique which is used to enhance its tribological properties. A systematic study for the effect of plasma nitriding on the functional properties of Ti alloy substrate is important considering its biomedical application.

Hence the objective of this project is to perform plasma nitriding of TA at different temperature and nitrogen percentage. After plasma nitriding the samples will be characterized by using XRD, SEM, TEM ,nanoindentation etc. The major characterization will be corrosion resistance measurement and hardness measurement.

Relevant references [Publications, web links etc.]:

- 1) "Structural, Mechanical and Corrosion Resistance Properties of Ti/TiN Bilayers Deposited by Magnetron Sputtering on AISI 316L, K. SHUKLA , R. RANE , J. ALPHONSA , P.MAITY , S. MUKHERJEE, Surface & Coatings Technology, 324 167, 2017".
- 2) "Nano- and Micro-Tribological Bbehaviours of Plasma Nitrided Ti6Al4V Alloys ,ANIRUDDHA SAMANTA , MANJIMA BHATTACHARYA , ITISHREE RATHA , HIMEL CHAKRABORTY, , SUSMIT DATTA , JITEN GHOSH , SANDIP BYSAKH , MONJOY SREEMANY , RAMKRISHNA RANE , ALPHONSA JOSEPH , SUBROTO MUKHERJEE , BISWANATH KUNDU , MITUN DAS , ANOOP K. MUKHOPADHYAY, Journal of the Mechanical Behavior of Biomedical Materials, 77 , 267, 2018

Eligibility: Only students of ...physics and material science branches can submit their application at

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