

## IMPROVEMENT IN SURFACE PROPERTIES OF Ti<sub>6</sub>Al<sub>4</sub>V ALLOY USING NITROGEN ION IMPLANTATION

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### ABSTRACT

Titanium and Ti<sub>6</sub>Al<sub>4</sub>V alloy are widely used as artificial hip joints, bone plates and dental implants. However; this alloy releases ions from the surface liable to do serious harm to human bodies. To overcoming surface originated problems, the most versatile and superior surface modification method is ion implantation. It has several advantages compared with other modification methods. In this study, the nitrogen was implanted by a process of ion implantation at 60 keV with different fluences of  $1 \times 10^{16}$ ,  $5 \times 10^{16}$ ,  $1 \times 10^{17}$  and  $5 \times 10^{17}$  ions/cm<sup>2</sup>. Corrosion resistance of Ti<sub>6</sub>Al<sub>4</sub>V and ion implanted Ti<sub>6</sub>Al<sub>4</sub>V were investigated by an electrochemical test, at 37 °C in ringer lactate saline solution. ICP-AES studies were carried out to determine amount of ions leached out from samples when kept immersed in ringer lactate saline solution. The implanted samples showed variation in the corrosion resistance and microhardness with varying fluences. The sample implanted at  $1 \times 10^{17}$  ions/cm<sup>2</sup> showed an optimum corrosion resistance.

