

## Diffusion Treatment of Niobium and Molybdenum on Pur Titanium and Titanium Alloy Ti-64al and Their Properties

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**Abstract :** This study aims to obtain a surface of pure titanium and titanium alloy Ti-64Al with high performance by the diffusion process. Two agents metal alloy have been used in this treatment, niobium (Nb) and molybdenum (Mo), spread on elemental titanium and Ti-64Al alloy. Nb and Mo are used as powder form to increase the contact surface and to improve the distribution. Both Mo and Nb are distributed on samples of Ti and Ti-64Al at 1100 °C and 1200 °C for 3 h. They were performed to effect different experiments objectives. This work was achieved to improve some properties and microstructure of Ti and Ti-64Al surface, using optical microscopy and SEM and study some mechanical properties. The effects of temperature and the powder contents on the microstructure of Ti and Ti-64Al alloy, different phases and hardness value of Ti and Ti-64Al alloy were determined. Experimental results indicate that increasing the powder contents and/or the temperature, the  $\alpha + \beta$  phases change to the equiaxed  $\beta$  lamellar structure. In particular, experiments in 1200 °C were created by diffusion  $\alpha + \beta$  phases both equiaxed  $\beta$  phase laminar and  $\alpha + \beta$  phase, thus meeting the objectives were established in the work. In addition, simulation results are used for comparison with the experimental results by DICTRA software.

**Keywords :** diffusion, powder metallurgy, titanium alloy, molybdenum, niobium

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