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Effect of Ageing Treatment on the Microstructure and Hardness of the Ti6Al4V Alloy

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Abstract

The effects of ageing temperature, time and cooling medium on the microstructure and hardness of a solution treated Ti6Al4V alloy were investigated. The furnace cooling after ageing for 0.5 hours gave a homogenous structure with higher hardness values than the solution treated and water quenched Ti6Al4V alloy. Increasing the ageing time to 2 hours reduced the alloy hardness. Ageing at temperatures between 500 and 700^{0}C, followed by furnace cooling, led to homogenously distributed α- and β-phases within a fully martensitic matrix leading to improved hardness. A heterogeneous structure with a high variation in microhardness was revealed when ageing at 800 and 900^{0}C.