

Comparative Study of Isothermal and Cyclic Oxidation on Titanium Alloys

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Abstract : Isothermal oxidation at 800°C for 50h and Cyclic oxidation at 600°C and 800°C for 40h of Pure Ti and Ti64 were performed in a muffle furnace. In Cyclic oxidation, massive scale spallation occurred, and the oxide scale cracks and peels off were observed at high temperature, it represents oxide scale that formed during cyclic oxidation was spalled out owing to stresses due to thermal shock generated during repetitive oxidation and subsequent cooling. The thickness of scale is larger in cyclic oxidation than the isothermal case. This is due to inward diffusion of oxygen through oxide scales and/or pores and cracks in cyclic oxidation.

Keywords : cyclic, diffusion, isothermal, cyclic

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