

Effects of Heat Treatment on the Mechanical Property and Corrosion Behavior of PT-7M Titanium Alloy

Tae-Kyu Kim, Byung-Seon Choi, Sang-Yoon Park, Yong-Hwan Jeong,
Doo-Jeong Lee, Moon-Hee Chang

Korea Atomic Energy Research Institute
P.O.Box 105, Yusung, Taejon 305-600, Korea

ABSTRACT

The effects of heat treatment on the mechanical property and corrosion behavior of PT-7M titanium alloy have been evaluated. The alloy was heat-treated in the temperature range of 500 to 1000°C for 1 hr, and water quenched. Tensile test results indicated that there was little effect of the α heat-treatment (from 500 to 900°C) on the strength and ductility of this alloy whilst there was a considerable reduction of the strength and ductility in the alloy heat-treated at the β -Ti phase region (1000°C). The hardness test results revealed that there was little effect of the α heat-treatment on the hardness values whilst the β heat-treatment induced a significant increase of the hardness values in this alloy. It would be mainly attributed to the microstructure change by the β heat-treatment. Corrosion test results at 360°C in an ammonia aqueous solution of a pH 9.98 showed that the α heat-treatment of this alloy induced a significant reduction of corrosion resistance. It would be mainly responsible for the enlargement of precipitate size.