ONLINE ISSN : 1881-1361
PRINT ISSN : 0287-4547

Dental Materials Journal
Vol. 29 (2010) , No. 5 p.570-574

[PDF (1577K)] [References]

Effect of chromium content on mechanical properties of casting Ti-Cr alloys

Masayuki HATTORI[1)], Shinji TAKEMOTO[1)], Masao YOSHINARI[1)], Eiji KAWADA[1)] and Yutaka ODA[1)]

1) Department of Dental Materials Science, Tokyo Dental College

(Received November 13, 2009)
(Accepted May 24, 2010)

Abstract:
The mechanical properties of a series of binary Ti-Cr alloys were investigated. Chromium content ranged from 5 to 20 mass%. Dumbbell- and disk-shaped specimens of each alloy were obtained by casting for mechanical testing and microstructural observation. Yield strength (YS) at 0.2%, tensile strength (TS), elongation (EL) and Vickers hardness (Hv) were determined. The TS and YS of Ti-15Cr were similar to those of Ti-20Cr at approximately 880 or 900 MPa and higher than those of cp-Ti by nearly 55%. Among all Ti-Cr alloys, Ti-10Cr showed the lowest EL. At 50 μm below the surface, Hv ranged from 370 to 420. Addition of 15 or 20 mass% chromium to titanium yielded sufficient strength and relatively high elongation values. Judging from the results of the mechanical properties, the suitability of Ti-Cr alloys with 15 or 20 mass% chromium for use in dental prostheses.

Key words:
Mechanical property, Titanium alloys, Titanium casting

doi:10.4012/dmj.2009-118

JOI JST.JSTAGE/dmj/2009-118