

Title (en)

Zirconium based alloys having excellent creep resistance

Title (de)

Legierung auf der Basis von Zirkonium mit sehr guter Kriechfestigkeit

Title (fr)

Alliage à base de zirconium, présentant une bonne résistance au fluage

Publication

EP 1688508 A1 20060809 (EN)

Application

EP 05007163 A 20050401

Priority

KR 20050011362 A 20050207

Abstract (en)

The present invention relates to a zirconium based alloy composite having an excellent creep resistance and, more particularly, to a zirconium based alloy composite finally heat-treated to have the degree of recrystallization in the range of 40-70% in order to improve the creep resistance. The zirconium based alloy comprises 0.8#1/41.8 wt.% niobium(Nb); 0.38#1/40.50 wt.% tin(Sn); one or more elements selected from 0.1#1/40.2 wt.% iron(Fe), 0.05~0.15 wt.% copper(Cu), and 0.12 wt.% chromium(Cr); 0.10#1/40.15 wt.% oxygen(O); 0.006#1/40.010 wt.% carbon(C); 0.006~0.010 wt.% silicon(Si); 0.0005#1/40.0020 wt.% sulfur (S); and the balance zirconium(Zr). The zirconium alloy manufactured with the composition in accordance with the present invention has an excellent creep resistance compared to a conventional Zircaloy -4, and may effectively be used as a nuclear cladding tube, supporting lattice and inner structures of reactor core in the nuclear power plant utilizing light or heavy water reactor.

IPC 8 full level

C22C 16/00 (2006.01)

CPC (source: EP KR US)

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Citation (search report)

- [X] EP 1308966 A1 20030507 - KOREA ATOMIC ENERGY RES [KR], et al
- [X] US 6261516 B1 20010717 - JEONG YONG HWAN [KR], et al
- [X] US 5940464 A 19990817 - MARDON JEAN-PAUL [FR], et al
- [X] EP 1225243 A1 20020724 - KOREA ATOMIC ENERGY RES [KR], et al
- [A] R.F. ALLEN ET AL.: "ANNUAL BOOK OF ASTM STANDARDS 2001", 2001, ASTM, BALTIMORE, USA, XP002309830, 011486
- [A] FOSTER J P ET AL: "INFLUENCE OF FINAL RECRYSTALLIZATION HEAT TREATMENT ON ZIRCALOY-4 STRIP CORROSION", JOURNAL OF NUCLEAR MATERIALS, AMSTERDAM, NL, vol. 173, January 1990 (1990-01-01), pages 164 - 178, XP000255690, ISSN: 0022-3115

Cited by

FR2909798A1; EP1730318A4; CN103290261A; EP1930454A1; EP2122002A4; US9202597B2; US8320515B2; US8576977B2; WO2008090269A1; WO2008088261A1; WO2019162876A1

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