

Title (en)

High-strength amorphous alloy and process for preparing the same

Title (de)

Hochfeste amorphe Legierung und Verfahren zu deren Herstellung

Title (fr)

Alliage amorphe à haute résistance mécanique et procédé pour sa préparation

Publication

**EP 0905268 A1 19990331 (EN)**

Application

**EP 98111771 A 19980625**

Priority

JP 24752397 A 19970829

Abstract (en)

A high-strength amorphous alloy represented by the general formula:  $X_aM_bAlcTd$  (wherein X is at least one element selected between Zr and Hf; M is at least one element selected from the group consisting of Ni, Cu, Fe, Co and Mn; T is at least one element having a negative enthalpy of mixing with at least one of the above-mentioned X, M and Al; and a, b, c and d are atomic percentages, provided that  $25 \leq a \leq 85$ ,  $5 \leq b \leq 70$ ,  $0 < c \leq 35$  and  $0 < d \leq 15$ ) and having a structure comprising at least an amorphous phase. The element T may be at least one element selected from the group consisting of Ru, Os, Rh, Ir, Pd, Pt, V, Nb, Ta, Cr, Mo, W, Au, Ga, Ge, Re, Si, Sn and Ti. The amorphous alloy has high hardness and strength, excellent ductility, high corrosion resistance, and excellent workability and produced by preparing an amorphous alloy having the above composition and heat-treating in the specified temperature range to decompose the amorphous phase into a mixed phase structure of an amorphous phase and a microcrystalline phase.

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CPC (source: EP)

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Citation (search report)

- [XY] GB 2310430 A 19970827 - CALIFORNIA INST OF TECHN [US]
- [Y] EP 0513654 A1 19921119 - MASUMOTO TSUYOSHI [JP], et al
- [XY] PATENT ABSTRACTS OF JAPAN vol. 096, no. 012 26 December 1996 (1996-12-26)
- [X] PATENT ABSTRACTS OF JAPAN vol. 095, no. 010 30 November 1995 (1995-11-30)
- [X] INOUE A ET AL: "Effect of additional elements on glass transition behavior and glass formation tendency of Zr-Al-Cu-Ni alloys", MATERIALS TRANSACTIONS, JIM, DEC. 1995, JAPAN INST. METALS, JAPAN, vol. 36, no. 12, ISSN 0916-1821, pages 1420 - 1426, XP002087478

Cited by

EP2881488A1; CN104726801A; CN114164378A; US2016298217A1; KR100701027B1; KR20150066473A; US6692590B2; WO0227050A1; WO2053791A1; WO2015082175A1; US6896750B2; US6918973B2; US9752218B2; US9890447B2

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