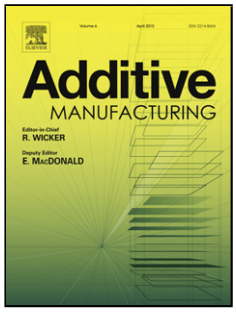
Accepted Manuscript



Title: Heterogeneous microstructures and corrosion resistance of biomedical Co-Cr-Mo alloy fabricated by electron beam melting (EBM)

Authors: Daixiu Wei, Yuichiro Koizumi, Akihiko Chiba, Kosuke Ueki, Kyosuke Ueda, Takayuki Narushima, Yusuke Tsutsumi, Takao Hanawa

PII: S2214-8604(18)30010-1
DOI: https://doi.org/10.1016/j.addma.2018.09.006
Reference: ADDMA 495

To appear in:

Received date: 6-1-2018
Revised date: 16-8-2018
Accepted date: 5-9-2018

Please cite this article as: Wei D, Koizumi Y, Chiba A, Ueki K, Ueda K, Narushima T, Tsutsumi Y, Hanawa T, Heterogeneous microstructures and corrosion resistance of biomedical Co-Cr-Mo alloy fabricated by electron beam melting (EBM), *Additive Manufacturing* (2018), https://doi.org/10.1016/j.addma.2018.09.006

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Heterogeneous microstructures and corrosion resistance of biomedical Co-Cr-Mo alloy fabricated by electron beam melting (EBM)

Daixiu Wei[a], Yuichiro Koizumi [a*], Akihiko Chiba [a], Kosuke Ueki [b], Kyosuke Ueda [b], Takayuki Narushima [b], Yusuke Tsutsumi[c], Takao Hanawa[c]

[a] *Institute for Materials Research, Tohoku University, 2-1-1 Katahira, Sendai, Miyagi 980-8577, Japan*

[b] *Department of Materials Processing, Tohoku University, 6-6-02 Aramaki Aza Aoba, Sendai, Miyagi 980-8579, Japan*

[c] *Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, 2-3-10 Kanda-Surugadai, Chiyoda, Tokyo 101-0062, Japan*

*Corresponding author.

Present address: Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University, 2-1 Yamadaoka, Suita, 565-0871, Japan

Email-address: ykoizumi@mat.eng.osaka-u.ac.jp (Y. Koizumi)

Abstract

We have investigated the spatial distribution of microstructures of a Co-Cr-Mo alloy rod fabricated by Electron Beam Melting (EBM) method along built height. The topside of the rod is rich in γ-fcc phase and consists of fine grains with high local distortion density. The bottom part has an ε-hcp single phase and consists of relatively coarser grains with low local distortion density. The middle part of the rod consisted of the mixture of both phases. The mean grain size increases from 56 μm (at the top of the rod) to 159 μm (at the bottom), and is accompanied by a decrease in the γ-fcc phase fraction. On the other hand, a large number of precipitates including the main $M_{23}X_6$ phase and minor phases (η-phase and π-phase) were observed. The area fraction of the

Download English Version:

https://daneshyari.com/en/article/11027725

Download Persian Version:

https://daneshyari.com/article/11027725

Daneshyari.com