Title: A 12R Long-period Stacking-ordered Structure in a Mg-Ni-Y Alloy

Authors: Cheng Liu, Yuman Zhu, Qun Luo, Bin Liu, Qinfen Gu, Qian Li

PII: S1005-0302(18)30162-2
DOI: https://doi.org/10.1016/j.jmst.2018.06.015
Reference: JMST 1286

To appear in:

Received date: 12-6-2018
Revised date: 15-6-2018
Accepted date: 17-6-2018

Please cite this article as: Liu C, Zhu Y, Luo Q, Liu B, Gu Q, Li Q, A 12R Long-period Stacking-ordered Structure in a Mg-Ni-Y Alloy, *Journal of Materials Science and Technology* (2018), https://doi.org/10.1016/j.jmst.2018.06.015

A 12R Long-period Stacking-ordered Structure in a Mg-Ni-Y Alloy

Cheng Liu [a, 1], Yuman Zhu [b, 1] Qun Luo [a], Bin Liu [a], Qinfen Gu [c], Qian Li [a, *]

[a] *State Key Laboratory of Advanced Special Steels & Shanghai Key Laboratory of Advanced Ferrometallurgy & School of Materials Science and Engineering & Shanghai Institute of Materials Genome &Materials Genome Institute, Shanghai University, Shanghai 200444, China*

[b] *Department of Materials Science and Engineering, Monash University, Victoria, 3800, Australia*

[c] *Australian Synchrotron, Clayton 3168, Australia*

*Corresponding author. Prof. Q.Li; Tel: 021-66135659; Fax: 021-66135659.

E-mail address: shuliqian@shu.edu.cn (Q. Li).

[1]These authors contributed equally to this work.

[Received 12 June 2018; revised 15 June 2018; accepted 17 June 2018]

A hitherto unreported long-period stacking-ordered (LPSO) phase, designated 12R, was observed in a $Mg_{80}Ni_5Y_{15}$ (at.%) alloy. Microstructure was investigated by electron diffraction and high-angle annular dark-field scanning transmission electron microscopy. Results show that the 12R has a trigonal lattice ($a = b$ = 1.112 nm, c = 3.126 nm, $\alpha = \beta = 90°$, and $\gamma = 120°$). Unit cell of the 12R is consisted of three ABCA-type building blocks and each building block contained dominant Ni_6Y_8-type building clusters. A sound structural model is proposed based on relative positions of Ni_6Y_8 clusters in neighboring building blocks.