Effect of Au Addition on Intermetallics Precipitation Tendency and Repassivation of $\text{Al}_{88}\text{Fe}_5\text{Y}_7$ Glassy Alloy

P. J. Yin¹, C. G. Jia¹, L. Y. Guo¹, H. R. Geng², Y. S. Tian¹, Z. H. Zhang¹, W. M. Wang^{1,*}

¹ Key Laboratory for Liquid-Solid Structural Evolution and Processing of Materials, Ministry of Education, Shandong University, Jinan 250061, China

² School of Materials Science and Engineering, University of Jinan, 106 Jiwei Road, Jinan, 250022, China

*E-mail: weiminw@sdu.edu.cn

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The effects of Au addition and annealing on selective intermetallics precipitation and corrosion behaviors of the as-spun $\text{Al}_{88-x}\text{Fe}_5\text{Y}_7\text{Au}_x$ ($x = 0, 0.5$ and 1) alloys have been investigated. When Au content $x = 0$, the alloy has more preferentially precipitated AlY phase, the larger ΔE ($= E_p - E_{\text{prot}}$, E_p and E_{prot} are pitting and protective potentials) in Tafel curve, and the higher steepness k_s ($= dE/d\log(I)$) on the reverse scan, suggesting that there exist some tunnels in the pit interiors and the repassivation can be hindered; whereas in case of $x = 0.5$ and 1 , the AlFe phase precipitates more easily, and the ΔE and k_s of the alloys are lower obviously. The repassivation and pitting transition of $\text{Al}_{88-x}\text{Fe}_5\text{Y}_7\text{Au}_x$ ($x = 0, 0.5$ and 1) glassy alloys are closely associated with the intermetallics precipitation tendency and fraction of amorphous phase.

Keywords: intermetallics selection; passivation; pitting transition; steepness; tunnel

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