Short Communication

Magnetic Properties, Corrosion Resistance and Crystallization Behavior of Nd-Fe-B Alloys

Y. Gu^{1,*}, S.H. Hua², M.X. Pan², Z.H. Huang²

¹ Qianjiang College, Hangzhou Normal University, Hangzhou, 310036, P. R. China

² Zhejiang Fangyuan Test Group Co., LTD, Hangzhou, 310018, China

*E-mail: guyonghz@126.com (Yong Gu)

doi: 10.20964/2020.06.52

Received: 25 February 2020 / Accepted: 30 March 2020 / Published: 10 May 2020

The microstructure and magnetic properties of the over-quenching (OQ), over-quenching followed by annealing and optimum direct quenching (DQ) for the Nd₁₁Fe₈₃B₆ alloys are studied. It is shown that the OQ + annealed α -Fe/Nd₂Fe₁₄B alloy possesses a smaller and homogeneity nanocrystal microstructure, compared to the optimum DQ α -Fe/Nd₂Fe₁₄B alloy. Meanwhile, the proper OQ + annealed is optimal to enhance the corrosion resistance and the magnetic properties ($M_r = 87.44$ emu/g, $H_{cj} = 329$ kA/m, $(BH)_{max} = 64.42$ kJ/m³) of the α -Fe/Nd₂Fe₁₄B nanocomposite alloys. The apparent activation energies $E_c(x)$ of crystallization for Nd₂Fe₁₄B and α -Fe phase show that nucleation is difficult and growth is easy in the process of amorphous crystallization for the over-quenching (OQ) alloy.

Keywords: Magnetic property; Corrosion; Crystallization behavior

[FULL TEXT](#)

© 2020 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).