Short Communication

Correlation between Magnetic Properties and Corrosion Resistance of SmCo₅/α-Fe Nanocomposite Magnet

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doi: 10.20964/2019.05.14

Received: 8 Janary 2019 / Accepted: 17 February 2019 / Published: 10 April 2019

The exchange-coupled SmCo₅/α-Fe nanocomposite magnets were fabricated by the micrometer sized of SmCo₅ and α-Fe powders. The effect of α-Fe content on the microstructure, magnetic properties and corrosion resistance of these nanocomposite magnets were systematically discussed. The results revealed that show the enhanced exchange-coupling behavior with $(BH)_{\max} = 11.3 \text{ kJ/m}^3$ was obtained with the α-Fe content at 7.5 wt%. The magnetization reversal behavior and exchange coupling effect were investigated by analyzing recoil loops and δm -plots, it shows that the exchange coupling interaction is enhanced and finally enhancing the magnetic properties with α-Fe added. Besides, a remarkably improvement in electrochemical stability and corrosion resistance for the SmCo₅/α-Fe nanocomposite magnet with the α-Fe added, which is mainly attributed to the coexistence of hard and soft magnetic phases in the magnet.

Keywords: SmCo₅/α-Fe; Corrosion; Magnetic properties; Magnetization behavior

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