

Novel Methods Towards Selective Surface Modification of Nd₂Fe₁₄B Magnets to Achieve High Performance Permanent Magnets

Disclosure Number

201503461

Technology Summary

This invention disclosure reports a method of selectively applying Dysprosium (Dy) to improve the coercivity of Nd₂Fe₁₄B-based magnets. We have determined the corners of the magnet surface where the demagnetization fields are high through microscopic calculation of the demagnetization factors. Based on these results, we have selectively coated Dy onto Nd₂Fe₁₄B magnet surfaces and improved its energy product by optimized annealing conditions. The optimized process conditions can also be achieved by selective heating. With heating, the magnet can be selectively heated to allow the diffusion of Dy into the Nd₂Fe₁₄B matrix.

Inventor

PARANTHAMAN, MARIAPPAN
Chemical Sciences Division

Licensing Contact

CALDWELL, JENNIFER T

UT-Battelle, LLC

Oak Ridge National Laboratory

Rm 137, Bldg 4500N6196

1 Bethel Valley Road

Oak Ridge, TN 37831

Office Phone: (865) 574-4180

E-Mail: CALDWELLJT@ORNL.GOV