The Effect of Nano-TiC Addition on Sintered Nd-Fe-B Permanent Magnets - DTU Orbit

(05/10/2019)

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This paper addresses the effect of nano-TiC addition on sintered Nd-Fe-B permanent magnets. TiC nanoparticles were added to sintered Nd-Fe-B magnets with a specific aim to improve the Curie temperature and thermal stability. A standard powder metallurgy route was adopted to prepare the magnets. It was found that introducing nano-TiC prior to jet milling was effective as the nanoparticles dispersed in the final alloy, concentrating in the neodymium-rich phase of the magnets. Magnets with optimal properties were obtained with the addition of 1 wt% TiC nanoparticles. The hysteresis loop for such magnets showed an improved shape and VSM analysis a coercivity value of 1188 kA/m, a remanence value of 0.96 T and a maximum energy product of 132 kJ/m3. The maximum working point and the Curie temperature of the developed magnets were 373 K and 623 K respectively.

General information
Publication status: Published
Organisations: Department of Energy Conversion and Storage, Electrofunctional materials, Department of Wind Energy, Wind Turbine Structures and Component Design, Tallinn University of Technology, National Institute of Chemical Physics and Biophysics, Tallinn
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Number of pages: 11
Pages: 23–28
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Journal of Magnetism and Magnetic Materials
Volume: 429
ISSN (Print): 0304-8853
Ratings:
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.97 SJR 0.786 SNIP 1.314
Web of Science (2017): Impact factor 3.046
Web of Science (2017): Indexed yes
Original language: English
Electronic versions:
The Effect of Nano. Embargo ended: 24/12/2018
DOIs:
10.1016/j.jmmm.2016.12.115
Research output: Contribution to journal › Journal article – Annual report year: 2016 › Research › peer-review