

Title (en)  
HEAVY RARE EARTH-FREE HIGH-PERFORMANCE NEODYMIUM-IRON-BORON PERMANENT MAGNET MATERIAL AND PREPARATION METHOD THEREFOR

Title (de)  
HOCHLEISTUNGS-NEODYM-EISEN-BOR-PERMANENTMAGNETMATERIAL OHNE SCHWERE SELTENE ERDEN UND HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)  
MATÉRIAU D'AIMANT PERMANENT NÉODYME-FER-BORE HAUTE PERFORMANCE SANS TERRES RARES LOURDES ET SON PROCÉDÉ DE PRÉPARATION

Publication  
**EP 4152348 A1 20230322 (EN)**

Application  
**EP 20942024 A 20200623**

Priority  
CN 2020097637 W 20200623

Abstract (en)  
The present application provides a heavy rare earth-free high-performance neodymium iron boron permanent magnet material and a preparation method thereof. The preparation method comprises: providing an anisotropic magnet material which has a chemical formula of  $(\text{Nd,Pr})_{x-1}\text{Fe}_y\text{B}_z\text{M}_z$ , wherein  $28.5\% \leq x \leq 29\%$ ,  $0.86\% \leq y \leq 0.92\%$  and  $0 < z \leq 2.5\%$ , and M comprises Co, Al, Cu, Zr and other elements; providing an auxiliary phase material which has a chemical formula of  $\text{Pr}_a\text{Ni}_{100-b}$ , wherein  $50\% \leq a \leq 65\%$  and  $35\% \leq b \leq 50\%$ ; and evenly mixing the anisotropic magnet material with the auxiliary phase material to obtain mixed magnetic powders, and then performing orientation profiling, sintering treatment and tempering treatment, so as to obtain the heavy rare earth-free high-performance neodymium iron boron permanent magnet material. The present application can significantly improve the coercivity of the neodymium iron boron permanent magnet material without the use of heavy rare earth while not affecting the magnetic property of the neodymium iron boron permanent magnet material, so as to obtain a neodymium iron boron permanent magnet material with excellent magnetic property.

IPC 8 full level  
**H01F 1/057** (2006.01); **H01F 41/02** (2006.01)

CPC (source: EP)  
**H01F 1/0577** (2013.01); **H01F 41/0273** (2013.01)

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)  
BA ME

Designated validation state (EPC)  
KH MA MD TN

DOCDB simple family (publication)  
**EP 4152348 A1 20230322**; **EP 4152348 A4 20230705**; **EP 4152348 B1 20240508**; **EP 4152348 C0 20240508**; WO 2021258280 A1 20211230

DOCDB simple family (application)  
**EP 20942024 A 20200623**; CN 2020097637 W 20200623