Size effect of hard magnetic properties of Fe-Nb-B-Tb milled alloys

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Magnetic materials are very important in nowadays technologies. Recently we have reported ultra-high coercivity of Fe-Nb-B-RE (6 at. % of Nb) bulk nanocrystalline alloys produced by the vacuum suction casting technique, i.e. more than 7 T at the room temperature and after some field annealing [1]. Such type of materials have a potential to be a base for a new type of spring-exchange composites with magnetic characteristics better than conventional Nd-based permanent magnets. This work refers to size effect of hard magnetic properties of $(Fe_{78}Nb_8B_{14})_{0.88}Tb_{0.12}$ alloy prepared by a vacuum suction casting technique and milled in a low-energy ball mill. Finally, a set of powders with different pulverization degree was obtained. In the presented paper selected magnetic and structural properties as a function of mean grain size are shown. The discussion is focused on application possibility of the obtained hard magnetic powders in designing of new magnetic composites containing ultra-hard magnetic phases.

References:

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