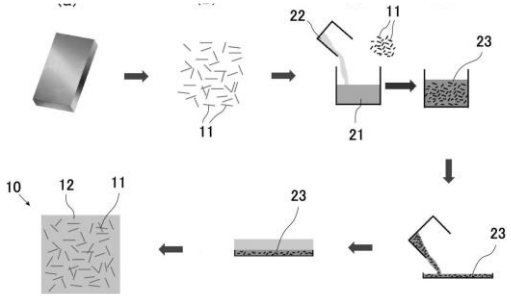
Tohoku Univ. Technology

Magnetostrictive composite material and its manufacturing method

Relatively soft material with excellent magnetostrictive properties



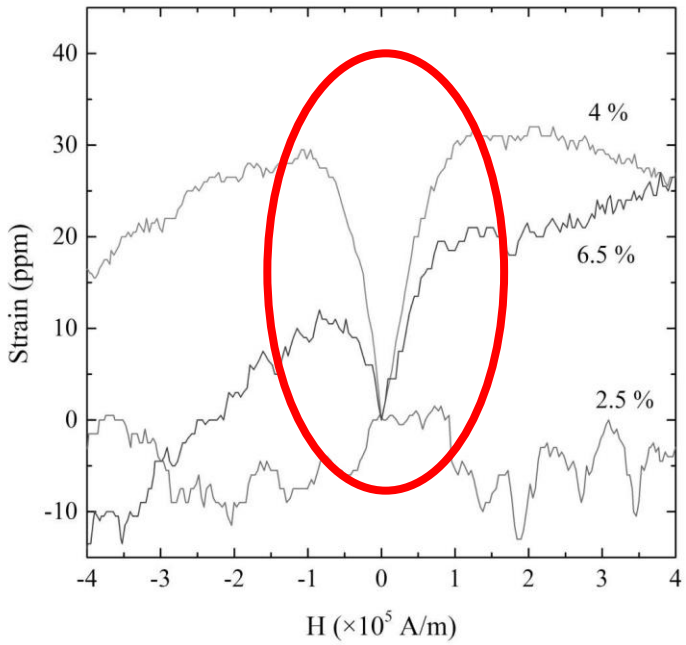
10. Magnetostrictive composite material
11. Wire shape
12. Matrix
21. Melted epoxy resin
23. Mixture

Overview

Since a flexible and soft magnetostrictive material does not exist,a soft magnetostrictive composite has been developed by mixing magnetostrictive material with resin. Wire and thin sheet from iron-based magnetostrictive alloy have also been developed as filler embedded in the matrix. However, although these magnetostrictive composite materials are soft, strong processing causes modification in the internal crystal orientation and generates internal defect, resulting in a significant reduction in magnetostrictive properties. In addition, since the filler material consisting of magnetostrictive material of predetermined dimension is embedded into the matrix, the composite material becomes a bit hard.

This invention is able to provide a magnetostrictive composite material which is relatively soft with excellent magnetostrictive properties, and its manufacturing method. This invention consists of an iron based magnetostrictive alloy which is characterized by a large number of wire shape having a predetermined range of diameter and length dispersed in a resin matrix which has excellent flexibility and softness. It also has an excellent magnetostrictive properties since the strong processing has only a limited impact on magnetostrictive properties modification.

A large amount of magnetostriction can be obtained by integrating a predetermined quantity of wire in the magnetostrictive composite material



Product Application

- Environmental power generation, sensor drive, power for data communication

Related Works

Z. Wang, F. Narita, et al. Materials 2020, 13(7), 1494. Fabrication, Modeling and Characterization of Magnetostrictive Short Fiber Composites

IP Data

IP No. : JP2021-168371
Inventor : WANG ZHENJIN, NARITA Fumio
Admin No. : T19-755

Contact

Tohoku Techno Arch Co., Ltd.
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