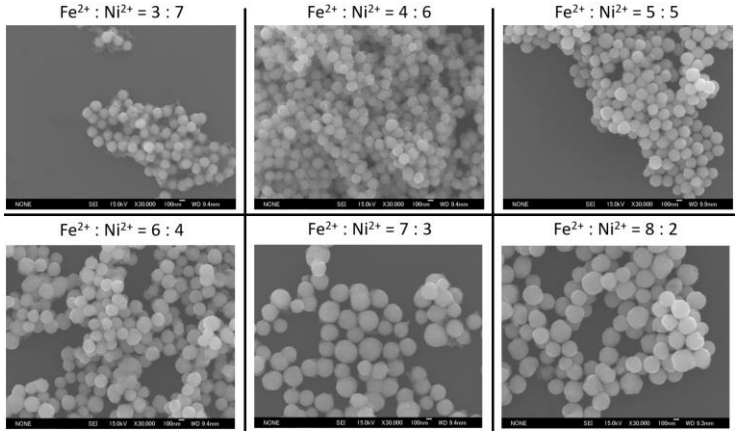
Tohoku Univ. Technology

Submicron-sized particles of Fe-Ni-B and Fe-Co-B

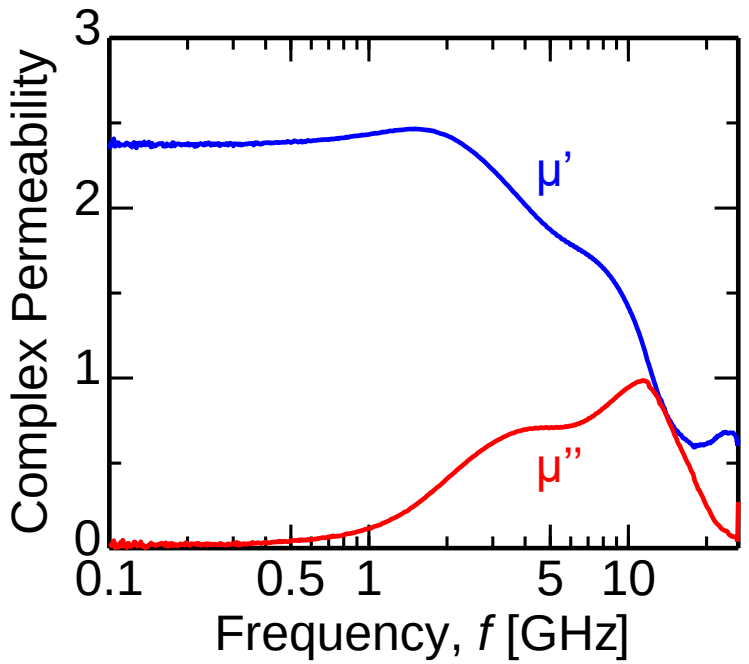
Suppression of eddy-current loss up to 1 GHz and realization of high frequency shift of resonance frequency



Overview

Submicron-sized magnetic particles are expected to be used as materials for high-frequency equipment operating at several GHz. Demand for submicron-sized magnetic particles is increasing amid the increasing use of 5G and the challenge of suppressing high-frequency noise.
However, it is generally difficult to produce submicron-sized particles. For example, in a top-down method such as grinding raw materials, the production of micron-sized particles is limited, and even in a bottom-up method such as reducing and depositing metal ions, microparticles aggregate to form micron-sized secondary particles. In addition, it is difficult to control the composition when reducing multiple metal ions and depositing compound microparticles.
The present invention relates to a method for producing submicron microparticles of Fe-Ni-B and Fe-Co-B soft magnetic materials. As shown in the upper right panel, it is characterized in that a true spherical primary particle without agglomeration is formed, and the composition can be easily controlled. The right panel shows the frequency characteristics of the complex permeability of the fine particle. Since the μ'' becomes near 0 up to 1 GHz and shows a peak in a few GHz band, the following applications can be expected.

Features・Outstandings



Product Application

- Magnetic powder antenna
- Noise suppression sheet for high frequency

Related Works

[1] K. Wakabayashi, T. Miyazaki, M.P. Nguyen, S. Muroga, Y. Endo, MMM2023, abstracts book, 57, 2023.

IP Data

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