Piezomagnetic ε-Fe_2O_3 crystals

CSIC through the Institute of Materials Science of Barcelona ICMAB has developed a new synthesis method to produce ε-Fe_2O_3 nanoparticles and its processing under high pressures and temperatures.

Industrial partners are being sought to collaborate through a patent license agreement.

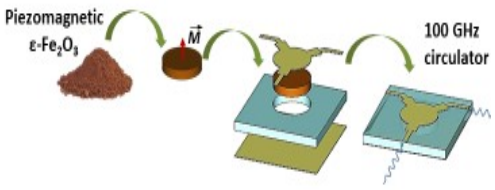
An offer for Patent Licensing

ε-Fe2O3 nanoparticles for magnetic memories or wireless communication devices

ε-Fe_2O_3 presents a large magnetic anisotropy that makes it interesting for technological applications related to magnetic memories and to the development of self-biased non-reciprocal devices which are appealing for the forthcoming generations of wireless communications.

ε-Fe_2O_3 nanoparticles should be above 25 nm to retain their magnetization. There are several methods to prepare these nanoparticles, but none of them is scalable, making impossible an industrial application.

We present a new method for the synthesis of piezomagnetic ε-Fe_2O_3 nanoparticles of sizes above 25 nm. The nanoparticles can be used for the manufacturing of magnetic memories or wireless communication devices as self-biased non-reciprocal devices, such as miniaturized circulators for high-frequency (above 100 GHz) wireless communications.



Fabrication of a planar microstrips circulator

Main innovations and advantages

- Easily scalable and sustainable synthesis.
- Piezomagnetic property of ε-Fe_2O_3 makes it possible to obtain magnetized parts by sintering the material under uniaxial pressure.
- Magnetized nanoparticles can be used in planar microstrips circulators.

Patent Status

Patent application filed suitable of international extension

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