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Advances in Magnetic Alloys

Guest Editor:

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Message from the Guest Editor

A magnetic alloy is a combination of different metals that contains, but are not limited to, at least one of the three main magnetic elements: iron (Fe), nickel (Ni), or cobalt (Co), etc. The strongest magnetic element is iron, which allows items made out of these alloys to attract to magnets

Based on magnetisation type the magnetic alloys can be divided in two categories:

1) **Soft** magnetic materials—characterized by a very narrow hysteresis cycle (coercivity below about 10^3 A m^{-1}) and, therefore, by the ease with which they can be magnetized, even in weak magnetic fields.

2) **Hard** magnetic materials—characterized by a wide hysteresis cycle (coercivity above about 10^4 A m^{-1}), a high remanence and a high energy product (maximum volume of energy density that the magnet can provide externally as an independent source).

In particular, there is a more recently defined class of magnetic materials called **semi-hard** magnetic materials, dedicated to magnetic recording media. The hysteresis cycle of these materials is quite wide, but slightly narrower than that of permanent magnets.

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Message from the Editor-in-Chief

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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