

Recycling of end of life NdFeB magnets



General Scope:

In the frame of the “Sintermagrec” project, funded by the French National Research Agency (ANR-17-ASTR-0014-02), your mission will be to develop a new fabrication process of NdFeB magnets from recycled NdFeB magnets collected in urban mines. In the proposed process, sintered magnets collected in WEEE (Waste of Electrical and Electronic Equipments) are, first, pulverised into NdFeB powders. In a second step, the development of non-conventional sintering techniques using the powder opens up an interesting valorization perspective. Thus, within the framework of the proposed study, attention will be given to study the influence of the processing parameters on the induced microstructure and on the final magnetic properties

As part of the team, you will conduct the tests (heat treatments, milling, DRX, microscopy, etc...), exploit the results, report on the results (both written and oral reports).

Research topic and facilities available

In CNRS/ Néel Institute, you will benefit from the expertise of the TEMA group (Processing Elaboration Materials Applications, 6 persons) on the development of processes using intense magnetic fields, on the recycling processes as well as on the synthesis of alloys in various forms.

Facilities available in the group include high superconducting magnets, various processing tools (induction cold crucible, furnaces, milling facilities, separation tools, etc...) and characterization devices (laser granulometry, ATD/TGA, microscopy, etc...). All common facilities from Institut Néel available as well (SEM, magnetic measurements, DRX, etc...)

Possible collaboration and networking:

This subject is part of the "Sintermagrec" project, which involves both academic and industrial contacts.

Required skills:

- Interest in the recycling and the valorization of by-products.
- General curriculum with a specialty in Materials Science.
- Autonomy, initiative and ability to work in a team and to adapt to a collaborative project, which includes partners from academic research and industry.
- Knowledge in physicochemical processes and/or metallurgy is welcome.

Starting date: Spring 2020

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