



Agromining: farming metals for biosourced materials

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ABSTRACT

Integrating environmental impacts of metallic material production is a major challenge nowadays: carbon quotas are becoming more and more restrictive for industry and societal demand for low impact products is constantly increasing. At the same time, global population growth and development of new technologies (such as electric vehicles batteries) are pressuring resources, which are becoming scarce. Thus, the development of more environmental extraction and production processes for metals, using low-grade metal ores, is essential.

The objective is to present research progress on agromining, *i.e.* the use of hyperaccumulating plants as concentrators of metallic elements from secondary resources, such as natural soils, polluted sites or industrial wastes. A particular focus will be done on hydrometallurgical processes to isolate and purify the metal from the plant with compatible speciation with the market.

Currently, field experiments in Europe have shown that it is possible to extract more than 120 kg of nickel per hectare with *Odontarrhena chacidica* and to prepare a nickel oxide for glass industry. As a result of this work, the first objects produced from biosourced metal are for sale (Figure 1). A life cycle assessment has shown clear environmental benefits of this metal production process. Other metal recovery studies (rare earth elements, zinc, cadmium) with hyperaccumulators are in progress.



Figure 1 - Crystal object tinted with biosourced nickel oxide (Daum company)