

A strategic view for rare earth production in a competitive and sustainable form

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The demand for rare earths (RE) has been intensified by their large use, especially in high technology sectors. Supply difficulties have forced RE users to seek alternative sources and invest in the development of recycling technologies and options of reuse for these elements [1]. This study seeks to reveal the trends and ongoing changes in national and global prospects of RE. Additionally, it aims to analyze scientific collaboration networks in the examining both researchers and institutions with greater representation in the field. For this purpose, social network analysis methods were used to build and analyze co-authorship networks based on scientific publications retrieved from the Web of Science (WoS) database [1]. The results showed that the Brazilian collaboration network of industrial solid waste (ISW) research was extremely fragmented and contained 105 different groups, which were not connected to each other (figure 1). The Brazilian collaboration network of research in waste electrical and electronic equipment (WEEE) was small (37 researchers), but fragmented: researchers were divided into eight different groups that do not connect to each other (figure 2). In response to these claims, it was possible to envision a cooperation environment to strengthen relations between universities, businesses, research centers and government agencies. This networking environment could generate opportunities for information exchange and new knowledge creation to find solutions to the complex scenario of WEEE containing RE metals. A network focused on knowledge, entrepreneurship, innovation, business and competitiveness. According to the RE scenario characterized [1], it is clear that the entire action framework of the network involves the definition of niche opportunity strategies. This means a State compromise that simultaneously includes policies to encourage new WEEE reuse businesses, operational practices in each link of the RE production chain and preservation of end uses

specificities. In doing so, a decisive contribution will be made to our balance of trade by considerably raising the added value of our goods and services that embed RE-containing technology.

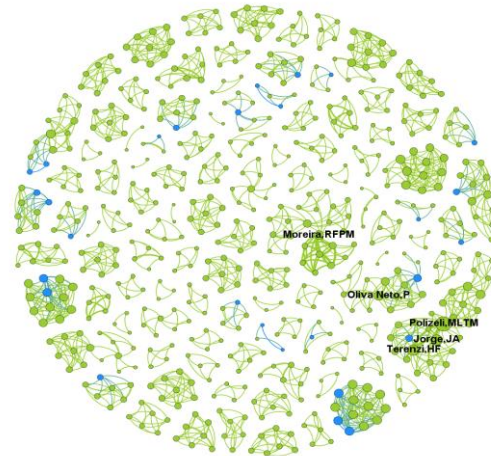


Figure 1. Brazilian collaboration network of

researchers working on industrial solid waste. Relationships between two researchers were mapped according to the co-authorship of scientific publications. Each node represents a researcher and two researchers were considered connected if they shared the authorship of an article. The color of the node indicates that the researcher is Brazilian (green) or foreign (blue). The size of the node reflects its degree centrality. The name of the most central researchers are indicated.

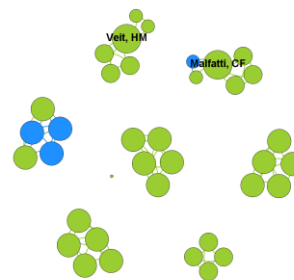


Figure 2. Brazilian collaboration network of researchers working on WEEE

References

[1] CAMPOS, T. R. T. et al. Strategic view for rare earths production in a competitive and sustainable form. **Environmental and Natural Resources Research**, Canada, v. 6, n. 4, p. 140-152, 2016. Disponível em: <<http://dx.doi.org/10.5539/enrr.v6n4p140>> Acesso em: 16 mar. 2018.