



LIFE13 ENV/ES/000173 GREENZO

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Specifications of GREENZO's demonstrators established

Once the inventory of waste generated in the industrial transformation process of non-ferrous metallic alloy (Zamak) has been done, a selection of those wastes with bigger potential of valorisation and according to their composition has been carried out, as those wastes with higher proportion of metallic zinc are those of interest.

In this project, zinc will be recovered in the form of Zinc Oxide (ZnO). ZnO is the most used zinc compound, only found in nature as zincite. Zincite is a mineral form of ZnO and contains up to 80% of zinc, presenting some pollutants as iron and manganese.

The ZnO recovered can be obtained through several industrial processes, although currently it is principally made from metallic zinc. Its purity and its quality depend on the methodology used in its production.

ZnO is an inorganic compound in form of white powder, non-soluble in water and very soluble in acids. Accordingly to the specifications indicated in this article, the major part of commercial ZnO is synthetic. ZnO is, thanks to its unique physical and chemical properties, such as chemical stability, a wide range of radiation absorption and high photostability, a functional material (see previous GREENZO newsletter). The applications that involve a high volume of ZnO are UV filters in cosmetic emollient used for solar protection, skin care and pharmaceutical formulations, hairspray coatings and polymeric surfaces, etc. as well as antimicrobial and bacteriostatic agents used in deodorants, medical and sanitary material, glass, pottery and self-cleaning materials.

Furthermore, the applications that employ a low volume of ZnO are infrared absorbers, textiles with UV protection, transparent conductive films on Light-Emitting Diodes (LED) and solar cells, among others. Finally, there exists a range of new applications of ZnO that consist on transparent conductor thin films of blue laser diodes, solar cells and Liquid Cristal Screens, sensors and catalysis, one the of the aimed applications of GREENZO.

The ZnO in catalysis is used as an essential support in the preparation of highly-active, selective and stable catalysers, in the reforming of bio-ethanol, as it helps in the dispersion of the active centre and increases its activity through the interaction between its active centre and the support. The key of this good activity seems to lie on the excellent physical-chemical properties of ZnO and its interaction with incorporated metals as active centre (Ni and Co, essentially). Considering these properties, the specifications of ZnO for this application have been established.

The other aimed application within this project is the vulcanisation of

rubber, as it helps reduce the decomposition temperature of the foaming agent and as an activator of the rubber compounds, in order that the organic accelerants are able to deploy all their activity during the vulcanisation with sulphur.

This project, which will be developed in 3 years, is funded by the European Commission through the funding instrument LIFE13 ENV/ES/000173 GREENZO. It is coordinated by AIJU and ITQ-CSIC, WORTEUROPE and CAUCHOS KAREY participate.

Signs of interest in GREENZO project



Last April 10th, representatives of the company Guzman Global visited AIJU in line with the great interest that GREENZO project arose. In the meeting held with them, the objectives of the project were explained, as well as the current development status. Victoria Bagues (R&D&I manager of Guzman Global – Minerals) insisted on the possibilities of the ZnO validation within the ceramic sector, as well as other working lines that can be of interest for both organisations in future collaborations.

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