TECHNOLOGY IDQW50

UNIVERSIDAD DE CHILE

Synthesis of nanoparticles at low cost for electrical conductors and other applications

University of Chile has generated a new manufacturing process for nanoparticles (NPs) in an aqueous medium, in an environment open to the atmosphere, environmentally benign, and with angular dependence on the transmission and reflection of light.

THE CHALLENGE

At present, the replacement of gold or silver nanoparticles (NPs) with lower-cost metal (NPs) with similar properties is not yet resolved. Although there are methods that produce copper (NPs), none of them achieves optical properties such as angular dependence in light transmission. This is relevant in the generation in the generation of solar energy, where a decrease in the cost of manufacturing solar cells (which are mainly due to the use of silver) would encourage the use of this energy source. Additionally, in other applications (for example, textiles with antiseptic properties) these (NPs) are expensive, and unstable.

THE TECHNOLOGY

This method allow the manufacturing of copper (NPs) which are stable under environmental conditions by means of environmentally benign procedures.

The method used allows stability against premature oxidation, and a pH between 5 and 12.5 providing greater versatility and stability in the synthesis.

The maturation of these (NPs) towards non-spherical morphologies allows to acquire optical properties, showing and angular dependence on the transmission and reflection of light.

STAGE OF DEVELOPMENT

- The method is scalable and currently up to 45 g per batch can be produced in a 15 L reactor

COMPETITIVE ADVANTAGES

- Size regulation of (NPs) between 10 and 200 nm.
- % Copper > 98%.
- Presentation: Suspensions or aqueous powders densely charged.
- Properties similar to gold and silver (NPs), but at a low cost.
- Optical properties such as birefringence.
- Stable method in environmental conditions.
- Environmentally benign procedure.

Reactor 15L, scalable.

Image of nanoparticles.

APPLICATIONS

- Electronics.
- Antiseptic textiles, appliances, others.

OPPORTUNITY

Available for **out-licensing** and collaboration in scaling and industrial assembly.

INTELLECTUAL PROPERTY/REFERENCES

- Patent Applications CL 2015-3974, US 16/067,298, EPO 16881386.3, CN 2016800814707.9.

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