NATURAL HYBRIDS NANOPIGMENTS SYNTHESIS FOR MULTIPLE INDUSTRIAL APPLICATIONS

TECNOLOGÍA PATENTADA

DATOS DE CONTACTO:

Research Results Transfer Office-OTRI
University of Alicante
Tel.: +34 96 590 99 59
Email: areaempresas@ua.es
http://innoua.ua.es

RESUMEN

The Colour and Vision Research Group of the University of Alicante has been designed a new process to develop nano-structured hybrid nanopigments (from synthetic or natural dyes). These nanopigments confer improved optical, thermal, and mechanical properties when they were applied on composite materials. The nanoclays, dyes, and additives have been selected depending on the composite matrix source. Also, it has been selected the additives order in the process of synthesis, based on the material properties that would be going to improve.

The parameters that could be control with this new system are: the adsorbed dye concentration, the degradation temperature of the reinforced dye, the degradation temperature of the final nanocomposite, the bending resistant modulus, and the UV-VIS colour fastness. Also, it can be controlled the optical properties as transparency and colouring power degree. It is looking for companies interested in commercial exploitation of these new colored nanomaterials.

VENTAJAS Y ASPECTOS INNOVADORES

It has been developed a novel method for synthesizing nanostructured hybrid nanopigments. Furthermore, it has been optimized the conditions of the synthesis in order to achieve the best optical, thermal and mechanical properties in materials in which these nanopigment could be applied on.

The method allows:

- It reduces the additives incorporated in the composite generation.
- It reduces the manufacturing composite cost.
- It maximizes the adsorbed organic dye (natural or synthetic) by nanoclays.
- It increases the degradation temperature of the organic dyes.
- It increases the polymer matrix degradation temperature.
- It improves the final material mechanical properties.
- It adjusts the transparency and colouring power of the synthetized material.
- It increases the degradation by UV-Vis light fastness of the coloured materials (Figure 6).
- It avoids the migration dye from the composites materials, by wet or dye friction (Figure 7).

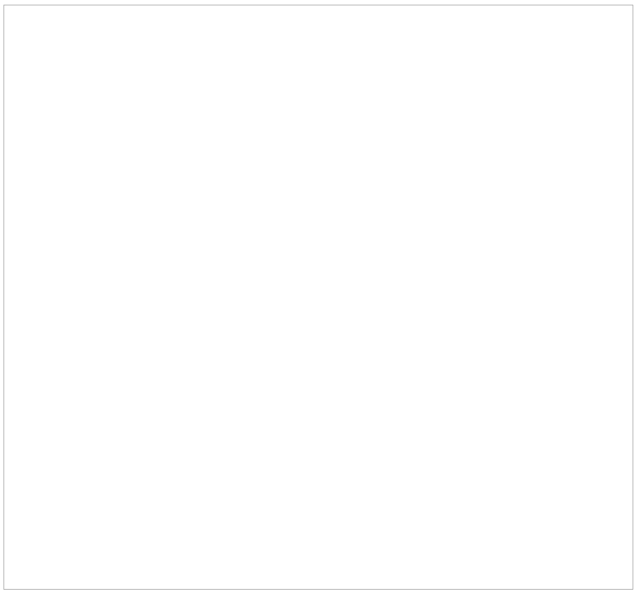


Figure 6. Epoxy biodegradable samples, modified by natural chlorophyll (red square), and nanopigments from the same natural dye, after an accelerated degradation UV-vis test.

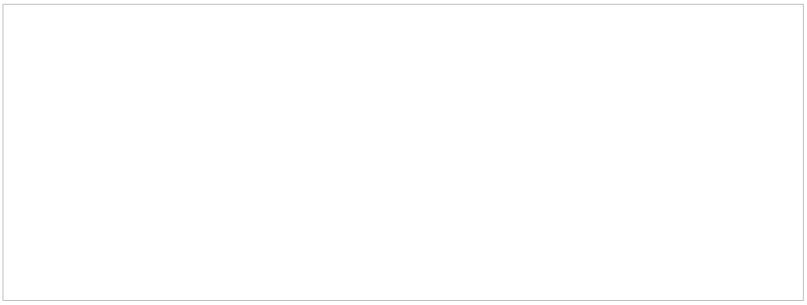


Figure 7. Pictures of the tissues witnesses from the wet rubbing test using the epoxy bioresin colored with three original natural dyes (NG, NO, NR), with a poor wet rubbing fastness. Also, in these pictures, it can be seen the followed clear whiteness tissues without dye migration effect, when it was used the nanopigment form.

APLICACIONES DE LA OFERTA

This technology is focusing on the **Material Science**, in particular, on the **nanostructured hybrid pigments synthesis**.

These nanopigments are able to provide the best optical, thermal, and mechanical **properties** of the materials in which it could be applied on. The materials in which this nanopigments could being applied are:

- Ceramics.
- Printing inks.
- Paints.
- Synthetic fibers.
- Natural fibers.
- Coating.
- Textiles.
- Paper.
- Polymeric materials.
- Biopolymers.
- Cement and concrete.
- Mortar.
- Construction materials.
- Cosmetics.
- Food packaging.
- Footwear.
- Toys.
- Wood and furniture.
- Stone and marble.

COLABORACIÓN BUSCADA

It is looking for companies interested in acquiring this technology for **commercial exploitation** through:

- License agreement.
- Searching for funding opportunities to new application developments, depending on the specific company requirements.
- Agreements on technology transfer and adaptation.
- To make technical repots and scientific assessment to the company.
- To provide specific customized training to the company requirements.
- To standardize services, calibration, national or international technical standard reports, etc.
- To provide technological support for those techniques that require highly skilled or sophisticated instruments, that are not available to the company.
- Staff exchange for defined periods of time (techniques learning, etc).
- To rent internal equipment to customers who want to carry out their own tests (Department of Optics, Pharmacology and Anatomy infrastructure, or Research Technical Services of the University of Alicante).