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Optinanopro: Novel nanocomposites and nanocoatings and their applications in the packaging, automotive and solar panel processing lines

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Nanocomposites have special physical and chemical properties and an array of potential applications, in particular they can be used to adapt surface properties and introduce additional functionalities. Performance of nanocomposites depends on a number of parameters, but nanoparticles dispersion and distribution state remain the key challenge in order to obtain the full nanocomposites' potential. Optinanopro project has worked to demonstrate the benefits of the introduction of nanotechnology into packaging, automotive and photovoltaic materials production lines. Special mention to the development and industrial integration of electrospray nano-deposition, online dispersion and monitoring system to ensure a constant quality of produced nanocomposites. Nano-enhanced coating has been applied by electrospinning, a phenomenon that occurs when an appropriate electric field is applied to a conductive solution. Electrospinning technology has been used to obtain both self-cleaning OPVs and product repellent surfaces (with tailored repellence to selected liquids) for easy emptying packaging. Bioinicia has achieved materials with tailored polarity including super hydrophobic properties but also amphiphobic ones, a quite peculiar behavior that is much less reported in the literature. In the case of OPV surfaces, hydrophobicity will allow the panels to self-clean from dirty rain, whereas the same effect will allow facilitating the emptying and therefore reduce leftover at end of life in case of polar liquids/pastes being packaged (e.g. oil in water emulsions for cosmetics). The process required a novel multistep approach that has been patented by Bioinicia on how to use electro-hydrodynamic processes for obtaining stable layers with target characteristics.

Biography

Amparo Verdu Solis holds a University Degree in Industrial Chemistry by the Polytechnic University of Valencia and Master's in Plastics and Rubber Materials. For 10 years, she developed her career as Researcher in AIMPLAS, Plastics Technology Centre. Currently, she is the R&D Project Manager of Bioinicia, SL, experts in Nanotechnology and Electro-Hydro Dynamic Processing. She has collaborated as an Expert Member in the European Committee for Standardization CEN/TC 249/WG 7/TG one Biodegradable mulch films. Now, she is involved in SBIOC Spanish BioCluster as President of the Cluster.

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