
Title: Synthesis of Reactive Nanoparticles for Coatings with Enhanced Chemical Resistance

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Abstract

Aqueous emulsions of polymer nanoparticles are often used as binders in paints and coatings. This is an alternative to the use of paints and coatings based on organic solvents, which are being ruled out due to environmental constraints. Still, the final properties of the films produced from aqueous formulations are usually not comparable with the ones formed from solvent-borne paints... yet!

In this work we produced reactive polymer nanoparticles to be used as binders for aqueous paints and coatings with improved resistance to chemicals and reduced VOCs emission.

We observed that despite remaining quite unreactive in emulsion (allowing very long periods of storage), these nanoparticles recover their reactivity when forming films, in the solid state, originating coatings with good malleability and enhanced resistance to chemicals.

May polymer emulsions be designed to compete with solvent-borne formulations in paints?...

...Why not?

Biography

Prof. Susana Piçarra received her undergraduate degree in Chemical Engineering from the Technical University of Lisbon, Portugal. After, she received her PhD in Chemical Engineering, Specialization in Polymers, from the same University in collaboration with the University of Toronto, Canada.

She began her independent career at the Polytechnic Institute of Setúbal and at Institute of Nanoscience and Nanotechnology, both in Portugal.

Prof. S. Piçarra is interested in producing novel binders for environmentally friendly coatings with improved properties. She has studied the influence of the binder polymer nanoparticles architecture in the chemical and mechanical resistance of the resulting coating. She has also produced smart hybrid polymer nanoparticles, aimed to be used as binders in high performance water-borne coatings, by encapsulating smart inorganic molecules into polymer nanoparticles.

Current S. Piçarra interests are also focused in producing anti-vegetative coatings, not only anti-fouling top-coats for marine applications but also anti-biocide coatings to reduce microbial contamination of public and healthcare environments.

Furthermore, S. Piçarra is currently collaborating in the orientation of a PhD student on the development of a new consolidant material for decayed stone for heritage conservation purposes, based on sol-gel and polymer technology.