

Nano-Reinforcement of Adhesives, Plastics, Paints and Coatings (Ramot)

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Technology

Reinforcement of common and proprietary polymers (plastics) and composite materials for coatings and casts with nano-additives in small percentages leads to improvement of anti crack, anti-scratch, anti-rust and anti-moisture properties.

Novel, patented, self-assembled organic aromatic peptide nanotubes and nanospheres exhibit exceptional thermal and chemical durability and outstanding mechanical properties. These nanostructures have demonstrated increase of shear and peel strength exceeding the reinforcement effect of several known inorganic nanofillers to composite materials and plastics.

The Need

Reinforcement of polymer plastics in order to improve mechanical properties and chemical and thermal stability is a widespread practice and necessary for their various applications. Within coating technology, there is increasing interest in the development of efficient anticorrosive additives able to replace the conventional inorganic anticorrosive pigments. Such materials are usually added to the paints in small concentrations but can also be in the form of an additional layer.

Potential Applications

The incorporation of nanopeptide materials can be used in coatings and paints, industrial paints and a wide range of plastics as an inexpensive substitute to the inorganic additives, offering superior properties and additional advantages.

Stage of Development

Up to 70% increase in shear strength and a magnification of more than 4 of the peel strength were measured on epoxy resin systems integrated with low concentrations of polypeptide nanomaterials. Such is considered a significant improvement of mechanical properties inviting further R&D for optimization and customization.

The fabrication process is currently optimized for preparation of research-required quantities and for feasibility testing amounts. There are known models for efficient scale up of manufacturing and potential partners for leading this effort.

Patents


Three granted patents and three additional patent applications in different stages. Various licensing models are available.

Supporting Publications

[Improvement of the Mechanical Properties of Epoxy by Peptide Nanotube Fillers](#), SMALL, Volume 7, Issue 7, April 4, 2011; N. Even, L. Adler-Abramovich, L. Buzhansky, H. Dodiuk and E. Gazit

Self-Assembled Organic Nanostructures with Metallic-Like Stiffness, Angewandte Chemie, Volume 122, Issue 51, December 17, 2010; L. Adler-Abramovich, N. Kol, I. Yanai, D. Barlam, R.Z. Shneck, E. Gazit and I. Rouso.

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