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UNIVERSITY OF TEXAS  ARLINGTON

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New Composite Materials for use in Coatings and Polymers

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TECHNOLOGY NEED

Synthesis of composite materials is a very active area of technology as they provide opportunities to create new novel compositions in coatings, optoelectronics, sealants, caulks, and adhesives to name a few. However, currently employed preparation processes generally involve simple physical mixing of the inorganic or metallic particles with the liquid reagents, leading to aggregation and degradation of compositions. Formulators have unsuccessfully attempted in resolving these issues and there remains a need for durable and efficient products.

INVENTION DESCRIPTION/SOLUTION

Methods for synthesis of compositions involving covalent surface functionalization of fine particles has been developed. It involves covalently plasma grafting a small organic molecule onto a particle, covalently attaching an organic monomer to the particle at the organic molecule, and polymerizing the organic monomer into a polymer. The process is independent of the nature or size of the particles. Additionally, the invention provides the ability to control surface density of reactive functional groups on the particle, a critical consideration in optimizing the physical properties of the composite materials.

APPLICATIONS

- Coatings, Photonics, Sensors
- Biofunctional materials
- Electrical Condensers
- Electrically conductive polymers
- Flame resistant materials

KEY BENEFITS

- Conformal coating
- Shape or size independent
- Use of wide range of functional groups
- Compatible with all chemical routes known to produce polymers
- Compatible with addition of co-polymer molecules

STAGE OF DEVELOPMENT

Prototyped

INTELLECTUAL PROPERTY STATUS

Patents Granted - [US9051402B2](#)



More about the Inventors:

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