

The Office of Technology Management

UNIVERSITY OF TEXAS  ARLINGTON

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Particles for conversion of light into desired wavelengths

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TECHNOLOGY NEED

Solar spectrum has wavelengths ranging from UV through visible to IR, of which photosynthetic organisms such as plants absorb only blue and red light for photosynthesis. Currently used traditional greenhouse canopies do not have the capability to convert solar wavelengths to blue and red light for efficient photosynthesis. Although methods of embedding light converting inorganic nano phosphors into greenhouse plastics have been used, they caused problems of aggregation, which resulted in loss of light transmission through the plastic matrix. Therefore, there is a need for particles that can enhance the light transmission as well as maintain the light converting properties.

INVENTION DESCRIPTION/SOLUTION

A solution to the problem of aggregating particles has been developed. It involves a method of surface coating of sulfide phosphors with silane ligands to make particles compatible with the polymer matrix with minimal to no changes in their luminescent properties. The resulting particles show good dispersion in polymer resins and can be embedded by extruding, film casting, solvent casting, bulk polymerization. The particles provide sources of varying wavelengths of light that can be used for lighting, full color displays, light source for plant growth, crop modification, agriculture & animal husbandry, mood enhancement, human health enhancement.

APPLICATIONS

- Full color displays
- Plant growth
- Crop modification
- Agriculture & animal husbandry
- Mood enhancement
- Human health enhancement

KEY BENEFITS

- Compatible with both organic or inorganic polymer matrix
- Films, transparent, and semi-transparent solid forms
- Light conversion of both natural and artificial light sources
- Accommodation of modifiers that can reduce heat and protect from UV damage

STAGE OF DEVELOPMENT

Prototyped

INTELLECTUAL PROPERTY STATUS

Provisional



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