IR Heat Reflective Coating

Tech ID: 22898 / UC Case 2013-252-0

BRIEF DESCRIPTION

Heat reflective coatings represent an important tool in the energy management of any building. Unfortunately these coatings are usually expensive and sometimes even toxic, thus increasing their production and application costs. Researchers from UCI's Chemical Engineering and Material Science Department have developed a new class of energy efficient coatings consisting of a material that is derived from a naturally occurring and inexpensive biomolecule.

This invention represents a novel heat reflective coating, which can be readily produced in large quantities at a very low cost. Moreover, the coating is fully biocompatible, further reducing total life cycle costs at both the production and installation stages, as well as the removal/replacement stages.

FULL DESCRIPTION

Energy is a large expenditure for all consumers and corporations. Buildings are typically subjected to excess heat loads from the infrared region of incident sunlight. By coating windows and rooftops with infrared reflective coatings, unwanted heating is minimized, which greatly reduces energy costs. However, most commercially available infrared coatings rely on expensive or toxic compounds, so they have not found widespread use beyond basic rooftop applications. For example, in the case of windows, heat reflecting solutions are often expensive, too opaque, or limited to the new construction or replacement sector, therefore eliminating the built environment market. The solution to these drawbacks is a cheap, environmentally friendly coating.

Researchers at UCI have synthesized a functional biomolecule that meets the requirements of functional infrared coatings for buildings. Thin films of this biomolecule exhibit a range of coloration, but most notably, their reflectance extends into the infrared region. The UCI research team has adapted an inexpensive method for coating a variety of substrates with this biomolecule, as well as strategies for modulating the reflectivity of the coated substrates. By modulating their thickness, they can fabricate coatings that are transparent enough for window applications.

SUGGESTED USES

Energy Saving Surface Coatings:

Buildings

Windows

Sports Gear

Clothing

Camping Equipment

ADVANTAGES

CONTACT

Richard Y. Tun
tunr@uci.edu
tel: 949-824-3586.



OTHER INFORMATION

KEYWORDS

IR coating, Energy efficiency, Window coatings, Built environment, Green buildings, Energy conservation, Biomimetics, Organic thin films, Reflective coatings

CATEGORIZED AS

- **Biotechnology**
  - Industrial/ Energy
- **Energy**
  - Other
- **Environment**
  - Other
- **Engineering**
  - Engineering

This invention represents a biocompatible coating, which can be produced and processed on a large scale for low cost. The processing utilizes known and commercially viable processes. Thus, our novel coating technology overcomes the twin hurdles of toxicity and cost, enabling improved energy efficiency in buildings.

» **Materials & Chemicals**

» Other

» Thin Films

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,807,122	10/20/2020	2013-252
United States Of America	Issued Patent	10,035,175	07/31/2018	2013-252

RELATED CASES

2013-252-0

STATE OF DEVELOPMENT

We have demonstrated our ability to tune the reflectance spectrum of our coatings from the ultraviolet, across the visible spectrum, and to the infrared. We have also optimized conditions for coating arbitrary substrates with this material.

UCI Beall Applied Innovation

5270 California Avenue / Irvine,CA
92697-7700 / Tel: 949.824.2683

© 2012 - 2020, The Regents of the University of California
Terms of use
Privacy Notice