Knowledge Transfer Office
香港城市大學
City University of Hong Kong

Improved Self-cooling Exterior Coatings

Energy & Environment

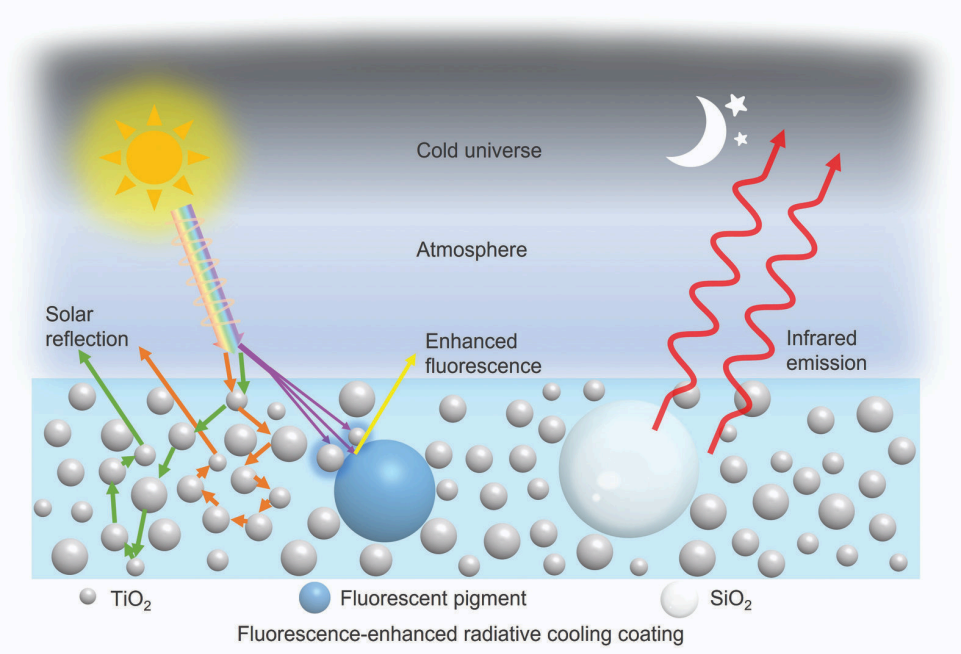
Health & Wellness

Buildings and Construction Technology

Consumer Electronics

Energy Conservation/Generation/Management/Storage (Battery)

Nanotechnology and New Materials



Fluorescence-enhanced radiative cooling coating

IP Status
Patent filed

Technology Readiness Level (TRL) ? 7

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Opportunity

Polymer coatings with commercially available TiO2 nanoparticles can passively cool down buildings, but the cooling effect is limited by the UV absorption of TiO2. We proposed a fluorescence enhancement strategy to compensate the UV absorption and hence improve the solar reflection and the cooling coating performance, which will promote large-scale applications of the passive daytime radiative cooling technology for combating global warming and energy crisis.

Technology

Achieving passive daytime radiative cooling requires both high solar reflection and large infrared radiation that minimize heat gain and simultaneously maximize radiative heat dissipation, respectively. In our technology, introducing fluorescent pigments into commercially available white coatings competes with TiO2 on UV absorption and re-emit part of the absorbed UV light so as to further reduce the net heat gain from solar irradiation and also make the cooling coatings colorful.

Advantages

- Low cost and eco-friendly
- Compatible with commercial coating materials and current construction methods
- Energy saving
- No VOC
- Colorful coatings

Applications

- Building envelope
- Textiles and clothes
- Electronic and Optoelectronics
- Warehouse, plant and oil storage tank
- Electric vehicles
- Aircrafts and spacecraft