

USF NEXUS INITIATIVE 2019 AWARD RECIPIENT

Elias Stefanakos

Development of Stable, Microencapsulated Thermochromic Materials for Energy Efficient Buildings

Materials play a very important role in the thermal behavior of buildings and, as a result, the building's energy consumption and environmental quality. Thermochromic (TC) materials are smart materials that can change their optical properties/color as a function of ambient temperature. These materials can play a significant role when introduced in surface coatings, by rejecting energy when the outside temperature is high (hot climates) and absorbing energy when the temperature is low (cold climates). For building applications, it is desirable to have TC materials that change color at low temperatures (i.e. 25-35 0C, 77-95 0F). Organic leuco dye TC materials are inexpensive and very promising for use in such coatings. However, leuco dyes suffer from degradation in ultraviolet (UV) and possibly other portions of the solar energy spectrum. The purpose of the proposed collaboration is to develop and test microencapsulated leuco dye TC materials that do not degrade when exposed to sunlight radiation.

Partnership:

Mattheos Santamouris, Ph.D.

University of New South Wales (Kensington, Australia)



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