Spectrally selective coatings for solar control glass

High heat-reflective and visible transmission for solar rays

We have developed spectrally selective coatings for solar control windows. The coatings prepared on glass can reflect more than 50 percent of solar heat rays while transmitting more than 80 percent of visible light, thereby minimizing disruption of natural lighting and viewing. The coatings can also cut ultra-violet light. These optical properties are realized by interference of light waves reflected or transmitted at interfaces of the coatings. Optical properties of the coatings can be designed according to various demands of application. The coatings have a multilayered structure consisting of titanium-based and silica-based oxides deposited by a sputtering process. The coated glass can reduce heat intake coming through windows, and thus reduces cooling load of the building in summer.

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Spectrally selective coating deposited on glass

Multifunctional ionic gelator for a variety of solvents

We have developed a novel “ionic gelator” based on an oligomeric electrolyte as a brand-new class of physical gelator. This gelator was prepared by a simple one-pot condensation reaction of commercially available two chemicals. We observed that the hydrogel was formed from ca. 1 wt% of an aqueous solution not only in a neutral water but also in an acidic solution (pH=1). The gelator is also applicable for organic solvents and ionic liquids by tuning the solubility via the anion exchange. In addition, the ionic gelator was also found to act as an efficient dispersant for single-walled carbon nanotubes (SWNTs) in water. Subsequently, it is easy to prepare “SWNT-hybrid hydrogel” by employing this bifunctional ionic gelator.

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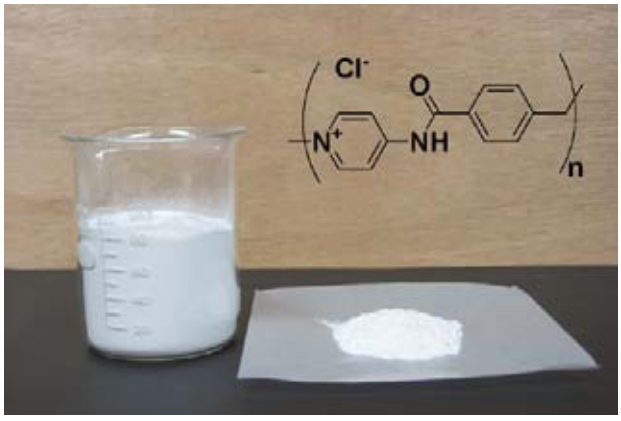

“Ionic gelator” based on an oligomeric electrolyte