

## **Optical property improvement of reactive BAPC/DAP blends with the aid of nano-silica coated titania**

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In the past few years, the application of nano-titanium dioxide (nano-TiO<sub>2</sub>) on catalysis and ultraviolet (UV) shielding has attracted much attention. At the same time, the usage of nano-TiO<sub>2</sub> as a UV absorber is limited in many practical areas because of the photocatalytic activity. In order to utilize nano-TiO<sub>2</sub> as UV absorbers in a safe and effective manner, the silica coated nano-titanium dioxide (nano-TiO<sub>2</sub>@SiO<sub>2</sub>) was prepared by sol-gel process. The nano-TiO<sub>2</sub>@SiO<sub>2</sub> was added into reactive bisphenol-A

polycarbonate/diallyl phthalate (BAPC/DAP) blends and its effect on the reaction-induced phase separation and properties of the composites were investigated. The results showed that the nano-TiO<sub>2</sub>@SiO<sub>2</sub> could affect the phase morphology of the BAPC/DAP/nano-TiO<sub>2</sub>@SiO<sub>2</sub> composites by lowering the phase separation rate. The higher the content of nano-TiO<sub>2</sub>@SiO<sub>2</sub>, the more difficult of the phase separation proceeding in the composites, which would lead to a rougher fractured surface of the composite film, much higher UV absorption ability and the transmittance of visible light. Meanwhile, the composites with proper content nano-TiO<sub>2</sub>@SiO<sub>2</sub> had highest glass transition temperature, i.e., 0.5 wt% compared with 0.1 wt% and 1 wt%.

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