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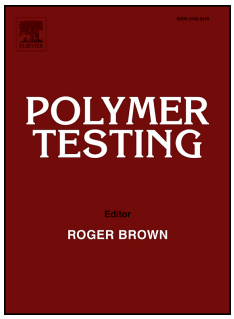


Effects of nanosilica, zinc oxide, titatinum oxide on the performance of epoxy hybrid nanocoating in presence of rubber latex

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ACCEPTED MANUSCRIPT

# EFFECTS OF NANOSILICA, ZINC OXIDE, TITATINUM OXIDE ON THE PERFORMANCE OF EPOXY HYBRID NANOCOATING IN PRESENCE OF RUBBER LATEX

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ABSTRACT

This work reports on the preparation and testing of organic-inorganic coatings-based on the diglycidyl ether of bisphenol A (DGEBA). Several types of coatings were prepared by solution casting, using different types of fillers, like silica nanoparticles (20.0 wt.%), zinc oxide (15.0 wt.%) and titanium dioxide (5.0 wt.%) in epoxy. Finally, the nanocomposite coatings were studied and compared. The nanocomposite hybrid coatings were studied for physical, structural, UV radiation absorbance, thermal stability, adhesive, morphological, heat and chemical resistance properties. Heat radiation was considered for the testing of heat resistance of the nanocoating. The effect of fillers on the physical properties of the coatings was analyzed by the curing time. Result analysis revealed that the nanocomposite hybrid coatings showed better properties on heat resistance. The presence of $TiO_2$ and $SiO_2$ nanoparticles showed better properties on chemical resistance for 21days of continuous testing. The UV light absorbance by the composites were analyzed and higher absorbance was noticed due to presence of ZnO and $TiO_2$. The heat transfer properties were analyzed particularly for epoxy/$SiO_2$/$TiO_2$/ZnO/rubber latex (ESTZL) nanocoating applied on to the surface of different materials like, concrete, steel and wood. Result analysis showed almost 90 to 99% efficiency on heat resistance by the ESTZL nanocoating.

***Keywords:*** *Epoxy hybrid nanocoating, nanosilica, zinc oxide, titanium oxide, rubber.*

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