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# SURFACE MODIFICATIONS AND CHARACTERIZATION OF NANOPARTICLES: REINFORCEMENT AND IMPROVE WEAR RESISTANCE OF PA 11.

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The incorporation of inorganic nanoscale particles into an organic matrix is promising systems for a variety of applications due to their extraordinary properties based on the interaction from the interface between particle and polymer matrix. Specific combinations of properties in polymeric nanocomposites, such as mechanical properties; flammability resistance, barrier properties, biomedical applications and wear resistance can be obtained by the addition of nanoparticles. A typical way for preparing polymeric nanocomposites is from the direct incorporation of inorganic nanoscale into molten polymers. However, an important problem to be addressed in preparation of these kinds of nanocomposites through dispersive blending is the uniformity of particle dispersion. Due to their hydrophilic nature of the most inorganic nanoparticles are hard to disperse homogeneously in bulk polymers. So far, a series of methods have been used to overcome this limitation, one of them, is to modify the nanofillers surface. The pretreatment technique is able to increase hydrophobicity of the fillers, enhance interfacial adhesion via chain entanglement or chemical bonding and eliminate the loosen structure of filler agglomerates. In the present work the surface modification of silica, alumina and titania nanopowders using a silane compound was evaluated. Here 3-aminopropyltrimethoxysilane was used because they render the power surface hydrophobic and additionally, offer the advantage to serve as a linking molecule between particle surface and polymer matrix if the reactive group of the silane is matched to the polymer. The quality of silane modification was characterized by termogravimetric analysis and solid state NMR measurements and have been demonstrated that the choose method showed a good surface modification of the nanoparticles.