## عنوان مقاله:

An Investigation of Tribological and Mechanical Behavior of PEEK Composites

## محل انتشار:

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## خلاصه مقاله:

PEEK (poly-ether-ether-ketone) is a semi crystalline thermoplastic with excellent mechanical and chemical resistance properties. In this work the influence of TiO2 nanoparticle at various concentration (0.5, 1 and 1.5 wt. %) on tribological and mechanical properties of PEEK were investigate. The wear volume and coefficient of friction was test by pin-on-disk sliding test at sliding speed 1 m/s and contact pressure 1.77pa at different sliding distance (5, 10, 15 and 20 km), with counterface from steel carbide 0.1µm Ra. The mechanical properties of PEEK nanocomposites were studied to evaluate the influence of the nanoparticles addition, as well as examined the relation between the tribological and mechanical behavior. In addition, the erosion rate examined by using Grains of sand (450 µm) as an erodent at different time every half hour period (0.5 to 2.5) hour, at 90° impingement angle in room temperature. The results showed that there is a significant drop in the wear volume and friction coefficient of PEEK nanocomposites compared with pure PEEK. The wear volume enhanced 80% and friction coefficient improved 50%. The lowest wear rate over duration was PEEK+0.5wt. %. The results of density and mechanical properties like tensile strength and hardness showed that there was a significant improvement 1.5% in density values. The tensile strength enhancement was 14% ware observed with the TiO2 nanoparticles addition. The erosion rate decrease was obtained at PEEK+0.5 .wt. % comparing with the pure PEEK by 95%

## کلمات کلیدی:

Tribology, Wear, Friction, Erosion, PEEK, TiO2