

B51 - Initial Friction Coefficient Studies On PDMS with MWCNT

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Poly(dimethyl siloxane) (PDMS) and derivatives are from a class of hybrid organic/inorganic polymers. This class is called silicone, it been extensively studied and commercialized. They are water repellent, heat stable, highly chemical resistant, and are electrically insulating. Due to these special properties, they are finding diverse industries applications as cosmetics, drug delivery, fabric care and paints and inks [1]. Because they can be operated at high and low temperature, they are also commonly used as oils, rubbers, hydraulic fluids, electrical insulation and moisture proofing agents. Multi Wall Carbon Nanotubes (MWCNT) has been attracted great attention because of their unique properties such as high mechanical strength and light weight, good heat conductance, and large surface area. A large number of papers have been reported that the nanoparticles addition on lubricant is effective in reducing wear and friction. The friction and wear decrease is dependent on nanoparticles characteristics, such as size, shape, and concentration [2]. In this paper we presented friction coefficient results of pure PDMS and PMDS with different concentrations of MWCNT. The MWCNT were dispersed in the PMDS by using ultrasonic bath. The tests were performed using a CETR ball-on-plat tribometer. The nanotubes were synthesized by plasma microwave in H₂/N₂/CH₄ environments, on titanium substrates covered by nickel particles as catalyst.

[1] P. Somasundaran, Somil C. Mehta, Parag Purohit. Silicone emulsions. *Advances in Colloid and Interface Science* 128-130 (2006) 103-109.

[2] Y.Y. Wu, W.C. Tsui, T.C. Liu. Experimental Analysis of Tribological Properties of Lubricating Oils with Nanoparticle Additives. *Wear* 262 (2007) 819-825.

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