

FRICTION AND WEAR PERFORMANCE OF HDPE/TALC- CALCIUM CARBONATE POLYMER COMPOSITES AGAINST SLIDING DISTANCE AND APPLIED LOAD

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ABSTRACT

In the present work, the friction and wear properties of high density polyethylene/talc and high density polyethylene/calcite polymer composites were studied. Fillers contents in the HDPE were 5, 10, 15, and 20 wt%. The morphologies of the fracture surfaces of specimens were observed with a scanning electron microscopy (SEM). The result showed that the addition of fillers to the composite changed the friction coefficient and wear rate. All specimen wear loss increases with increasing load and sliding distance; meanwhile the friction (static and dynamic) coefficient increases. Wear rate of all HDPE composites is larger than that of pure HDPE. The static and dynamic friction coefficient of HDPE/talc (80/20) is slightly less than that of pure HDPE at each load. The modulus of elasticity, elongation, Izod impact strength and hardness values of the composites were also determined.

Experimental: Nine different polymer composites were prepared. Compositions of HDPE polymer composites that were formed are given in Table 1.

Table 1 Composition of the different composite formulations

Groups	HDPE (wt %)	Talc (wt %)	Calcium Carbonate (wt %)
1	100	-	-
2	95	5	-
3	80	10	-
4	85	15	-
5	80	20	-
6	95	-	5
7	90	-	10
8	85	-	15
9	80	-	20

The boundaries and the contrast can be obviously seen between the filler and HDPE matrix on the fractured surfaces of polymer matrix (Figure 1).

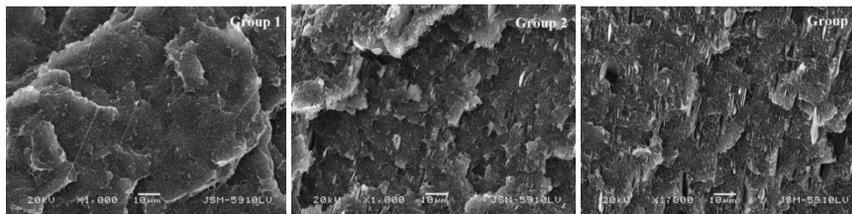


Fig 1 SEM micrographs of the HDPE polymer composites

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