and sliding marks appear more severe at the lower ageing duration T6 alloy – aged for 2 hrs.

It was seen from the Fig. 7 that sliding marks are appeared mostly parallel to the sliding direction. Small grooves and scratches appeared on the worn surface of the T6 alloy – aged for 6 hrs when it was subjected to 5 N load and sliding velocity of 0.8 m/s. Hence abrasion was dominant under low load and velocity conditions. The worn surfaces morphologies of as – cast alloys pointed out more ductile mode of fracture than the heat treated alloys.

The worn surface of the precipitated heat-treated (aged for 6 hrs) specimen was noticed to be smoother than those of the precipitated heat-treated (aged for 2 hrs) specimen. It reveals that the T6 – aged for 6 hrs has enhanced the wear resistance compared to T6 – aged for 2 hrs. This can be attributed to the formation of more intermetallic precipitates when the ageing duration was increased. The enhanced tribological behavior of the heat-treated Al alloys could be attributed to finer and more uniform distributed micro constituents and reduced cracking tendency. Hence, ageing duration enhances the precipitation hardening by the formation of $MgZn_2$ intermatallics which act as obstacles to dislocation during sliding.

8. Conclusions

Optimal conditions for attaining minimum wear loss are obtained using Taguchi S/N ratio analysis.

From the Taguchi results, it can be found that the optimum parameters were load (5N), sliding velocity (0.8 m/s) and T6 Al alloy aging period of 6 hrs in minimizing the wear of the composites

From ANOVA analysis, it was found that, the most significant influencing parameter on wear loss is the load, which accounts for 58.21 % of the total effect, followed by the heat treatment (37.59 %) the sliding velocity (2.76 %). It was observed that the wear loss increases with the increase in normal load and sliding velocity. The results also clearly demonstrate that the wear resistance of the precipitated heat-treated Al alloys is significantly higher as compared to that of the as - cast Al alloys within the observed range of applied load and velocity. The wear resistance of Al alloy increased with increasing aging duration. It can be concluded that T6 heat treatment (aged for 6 hrs) could be an effective method in enhancing the wear resistance of Al alloys significantly.

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