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Aluminum alloys have extensive application in industries. Their wide range of mechanical and physical properties is remarkable. Wear causes damage to a surface as a result of relative motion with respect to another substance. One key point is that wear causes damage which is not limited to loss of material from the surface.

This study is concerned with the effect of heat treatment on some properties of aluminum alloys which are Al-Mg-Si alloy before and after the addition which are (1.5gm Ti+0.5gm B).The heat treatment has included solution treatment at (530C°-560C°)with comparison effect of quenching media (air-water-PVA)followed by artificial aging at (175C°) gives better properties .Tests have been done on samples before and after addition and heat treatment .They were Vickers hardness test and wear test .Results reveal that heat treatment generally enhances the properties especially of the samples (Al-Mg-Si) alloy with the addition of (1.5gm T+0.5gm B)) Treatment and quenching were conducted in water because this treatment gives the best hardness and lowest wear rate. The X-ray test results prove appearance of Mg_2Si phase in the microstructure of Al-Mg-Si alloy before and after addition after heat treatment that leads to improvement in the mechanical properties as well as appearance of TiB_2 and $TiAl_3$ phases in microstructure of Al-Mg-Si alloy after addition, which precipitate on grain boundaries.

Experimental work has been designed using factorial design. Using the above experimental data ,factorial technique has been employed in optimization of various parameters ,which control the wear ,like applied load ,sliding time and temperature of solution treatment with their significance in respect of wear rate according to ANOVA method. Similarly ,the influence of indenter load ,indenter time and temperature solution treatment on hardness has been assessed using ANOVA and then the multiple linear regression models were evaluated for wear and hardness tests. A good agreement has been found between the estimated and experimental results with the preferred significant level.