force acting on the specimen from the die.

The previous result is consistent with that noticed by O. P. Grover and U.C. Jindal [13]. They proved that the liquid fraction percentage, the die angle and the reduction percentage effected in the ram speed in the extrusion of semi solid composites. Mechanical results for composites show that the yield strength of matrix as cast and as extruded decreases with further increase in volume fraction of reinforcement, B. S. Majumdar and A. B. Pandey [14] have found good agreement with this results. The results also show that ultimate tensile strength decreases when the temperature increases, but the yield strength increases at high temperatures.

Mechanical results revealed that the hot deformation process (extrusion) improving the strength. These improvements result from the reduction in the grain size and reduction in the porosity at room temperature and causes redistribution of SiC particles clusters in a more uniform distribution of the SiC particles ,but at 100 $^0$C the extrusion had no effect in ductility for the composites and unreinforced alloy specimens had no differences in the value at high temperature. More uniform distribution in the extruded specimens reduced the wear rate. Similar observation of the wear rate of the composites has been reported by several investigators [15,16]. The composites show a higher resistance to wear as compared to the unreinforced alloy. The results reveal that the resistance to wear of the composites improved by increasing the weight percent of the reinforcement of the composites.

The results of the finite element simulations for Pb-Sn alloy matrix composites show good agreement with the experimental results . This result is consistent with that resulted by Chen J.M. et al. [17]. They proved that the prediction for the mechanical properties of the reinforced metal matrix composites as cast and as extruded by finite element simulation revealed good agreement with experimental data.

Neural network found successful in prediction of wear results. This result is consistent with that resulted by Necat altinkok et al. [18]. They proved that the prediction for the mechanical properties of the reinforced metal matrix composites by using the artificial neural network revealed a good accord with experimental data.

## Conclusions

This investigation on the extrusion of particle reinforced aluminum alloy was conducted by using finite element and neural network modeling, the principal conclusions can be summarized as follows:

1. The addition of SiC particles to A355 and A356 alloy matrix composites are improve the strength of the alloy at room temperature, up to 10% SiC, then the strength decreases with further increase in the weight percentage of the reinforcement. Extruded composites generally followed a similar trend but with relatively higher values of strength.
2. extrusion process reduces the porosity content of the as cast composites and causes redistribution of SiC particles clusters in a more uniform distribution of the SiC particles
3. The tensile tests carried out at 150 $^0$C, the extruded composites showed gradual increase in tensile strength with increasing the weight percent of SiC particles up to a value of 10%by weight. Further increase in the weight % of particles resulted in decrease in the strength.
4. Ram speed increased when the die angle and the percentage of the reduction in area decrease.
5. Ram speed increased when liquid fraction percentage increase. That result from the