J Material Sci Eng 2014, 3:3
http://dx.doi.org/10.4172/2169-0022.S1.017

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference and Exhibition on
Materials Science & Engineering
October 06-08, 2014 Hilton San Antonio Airport, USA

Optimization of coating parameters on coating morphology of basalt short fiber for preparation of Al/Basalt metal matrix composites using genetic programming

M C Krishna Murthy[1] and **V Suresh Babu**[2]
[1]B. M. S. College of Engineering, India
[2]Vasuki Power Private Limited, India

The interface between the matrix and reinforcement plays a crucial role in determining the properties of metal matrix composites (MMC). Coating of the reinforcement is an important technique by which the interfacial properties can be improved. In this work, weight deposition of copper coating on short basalt fibers was carried out by electroless method. The electroless process used to deposit the copper coating onto the basalt fiber relies on a sequence of sensitization time, activation time and metallization time and these parameters need to be optimized to know the amount of coating thickness. These parameters considered for optimization process are evaluated for different time intervals. An attempt has been made to study the influence of coating parameters like time for sensitization, time for activation & time for metallization for deposition of copper on short basalt fiber using electroless coating technique. A mathematical modeling was generated using Genetic programming and the results were validated using DISCIPULUSTM software. This work gains significance because with reasonably minimum number of experiments, reliable model has been generated, validated and further, the process has been optimized. Results show that metallization time has the highest influence followed by activation time and sensitization time. Finally, confirmation tests were carried out to verify the experimental results

mckbms@gmail.com

Tribological behavior of martensitic stainless steels in lubricating condition

B V Manoj Kumar and **Vipin Goyal**
Indian Institute of Technology Roorkee, India

Martensitic stainless steel is used in a variety of industrial applications such as ball bearings and races, bushings, valve seats, pump impellers, hydraulic turbine runners where the wear is likely to occur in lubrication conditions. However the sliding wear of this important material in lubrication conditions is not yet considerably reported. In the present work, a ball-on-disk tribometer was used to study fiction and wear behavior of on 13/4 martensitic stainless steels disc against bearing grade steel specimen in lubricating conditions of Mak multigrade SAE grade 20W40 oil lubrication and canola oil at 5, 10 and 20 N load. Results indicate that the friction and wear of martensitic stainless steel were highly dependent on loading as well as lubricating conditions. Unlubrication conditions always exhibited high friction and wear. The coefficient of friction (COF) ranged from 0.93 in unlubricated condition to 0.08 in canola oil lubricated condition. The wear rate varied from $1x10^{12}$ m^3/Nm in unlubricated condition to $6x10^{-15}$ m^3/Nm in canola oil. It was observed that elasto hydrodynamic conditions occurred using different lubricating conditions did not necessarily result in less wear for the martensitic stainless steel. The low wear occurred at 10 N load for oil and canola lubrication conditions. The mild abrasion was found at the low wear conditions, while adhesion and abrasion were found responsible for high wear conditions. Oxidation was additionally observed in unlubricated conditions.

manojpatruni@gmail.com