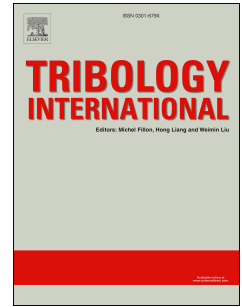


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1 **TRIBOLOGICAL BEHAVIOUR OF AL-1100-COCONUT SHELL ASH (CSA)**
2 **COMPOSITE AT ELEVATED TEMPERATURE**

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12 **Abstract**

13 Wear behaviour of Al1100- coconut shell ash (CSA) composites at high temperature is
14 investigated. The composites such as Al-5%CSA, Al-10%CSA and Al-15%CSA is prepared, using
15 stir casting technique. The specific strength of Al-15%CSA alloy composite is enhanced by 70% over
16 Al-1100 base alloy. Regression analysis has enabled to quantify slopes of all the materials. While the
17 pressure exceeds the critical value, abrasion increases rapidly, resulting in adhesive wear. When, the
18 temperature increases, the coefficient of friction initially increases up to 6 N/mm² and then decreases
19 due to the presence of oxides in debris, which are liberated from tribo surfaces. XRD and EDAX
20 analyses have revealed presence of oxide phases in the debris. SEM micrographs have confirmed
21 abrasive nature of wear.

22 **Keywords:** AMCs, Coconut shell ash, Elevated Temperature, Wear rate, Coefficient of
23 friction, Regression analysis.

24 **1. Introduction**

25 Particulate reinforced Al/Al-alloy composite (PRAC) materials are used for making
26 automobile components [1,2]. SiC/ Al₂O₃ are usually added to the liquid matrix of Al/Al-
27 alloy to make the composites [3,4]. Cost of SiC and Al₂O₃ particulates are \$2/kg and \$1.5/kg
28 respectively. In comparison, the estimated cost for coconut shell/ rice husk is around 0.5\$ per
29 kg. The agro waste materials are waste materials and therefore, need only processing cost.
30 Since reinforcing agents such as SiC/Al₂O₃ particulates are costlier, therefore, they can easily

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