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Effect of nano-clay mineral addition on tribological properties on jute/epoxy composite by using design of experiments approachHeruthunnisa Shaik¹ and B Chandra Mohan Reddy²¹Malla Reddy Engineering College, India²Jawaharlal Nehru Technological University, Anantapur, India

Polymer nano-composites have received immense attention in the recent years, as many of these materials present promising properties like high flexural strength, improved pressure barrier properties and depleting flammability. Polycarbonate is one of the most interesting ones, due to characteristic properties like high toughness and strength, excellent ballistic strength and good visual clarity. It could be expected that the addition of relatively low percentages of nano-reinforcements will result into remarkable improvements in mechanical and thermal properties. In this work, (Cloisite 25A) nano clay, Araldite LY 556 epoxy, HY 951 hardener were used to prepare the matrix at various blends 0%, 4%, 8%, and 10% by using hand lay-up method. And further detailed analysis was performed to study the tribological property of various percentage nano-clay (Cloisite 25A) loaded epoxies, with inclusion of jute fiber using Taguchi's technique. For this purpose, the test samples were prepared according to the ASTM: G99 standard, and the test was carried out with the assistance of Pin-on-Disc machine. For this experimentation L_{16} orthogonal array was used to evaluate the tribological property with four control variables such as % of nano-clay content, normal load, sliding velocity and sliding distance at each level on friction co-efficient along with wear rate. From the obtained results the combination of factors greatly influenced the process to achieve the minimum wear and coefficient of friction for jute fiber reinforced laminates were analyzed. The microstructure behavior of the fabricated samples were investigated with assistance of Scanning Electron Microscope (SEM), particle distribution was analyzed throughout the matrix by Transmission Electron Microscopy (TEM) analysis before and after the wear test. ANOVA analysis revealed the nano clay contribution on coefficient of friction and wear of the jute fiber laminate composites.

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