

## **Effect of silane treatment on SiC particles used as reinforcement in epoxy resins**

J. Abenojar Buendia; J.C. Real Romero; M.A. Martínez Casanova; M. Cano de Santayana Ortega

### **Abstract-**

Silicon carbide (SiC) is used as reinforcement in polymeric materials due to its high resistance to abrasive wear and hardness. However, sometimes the lack of anchoring between the SiC particles and the polymer produces some negative effects. The unbonding particles can act as crack initiators. They also can increase the wear erosion. The aim of this work is to improve the adhesion between the epoxy resin and the SiC particles using a silane coupling agent to coat the ceramic particles. In this study, a room temperature curing two-component epoxy was used. SiC particles with a mean diameter of 10  $\mu\text{m}$  were added to the epoxy resin in proportions of 6 and 12% by weight. The organosilane used was  $\gamma$ -glycidoxypropyltrimethoxysilane ( $\gamma$ -GPS). Strength was evaluated on bulk specimens by means of three-point bending test and hardness Shore D measurements. A pin on disk test was carried out to evaluate wear. Wear tracks as well as fracture surfaces of the materials were studied by scanning electron microscopy (SEM). Aluminium and steel specimens were also coated with the SiC/epoxy composites to evaluate its effectiveness as a wear-resistance coating. Pin on disk tests were done to study the SiC/epoxy composites' wear behavior.

**Index Terms-** Epoxy resin, Particle reinforcement, Silanes, Surface treatment, Wear

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