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**Investigation of Corrosion Behavior of SiC-Reinforced Al 6061/SiC Metal Matrix Composites Using Taguchi Technique**

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**Abstract**

In the present work, the statistical investigation on corrosion behaviour of Silicon Carbide-reinforced Al6061 Aluminium metal matrix (AMMCs) composites using Taguchi technique has been reported. Stir casting technique was adopted for synthesizing Al/SiC composites containing 0%, 2%, and 4% weight percentages of SiC. The corrosion studies were carried out for test variables—wt% of SiC, normality of solution, and corrosion duration for the as-cast composite specimens. The specimens were tested in NaCl solutions of normality 1.0, 1.5, and 2 and the exposure period ranging from 40 to 80 days. Corrosion characteristics of the composites were statistically analyzed by employing the design of experiments approach using Taguchi technique. Influence of various parameters on corrosion behavior of composites were investigated by Signal-to-noise ratio and analysis of variance. Result of the research determines that greater corrosion resistance was obtainable by composites when compared to monolithic aluminium 6061 alloy in the chosen corrosion media. This phenomenon of decrease of corrosion rate with exposure time was attributed to possible passivation of matrix alloy with the formation of protective layer formed on the specimen exposed to NaCl protecting the base metal from aggressive environment. The corrosion morphology was studied by scanning electron microscopy (SEM).

**Keywords:**

Stirr casting, Corrosion, Metal matrix composites, Design of experiments, Taguchi technique

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