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Experimental Analysis of Corrosion Rate of Developed Nanocutting Fluid from Admixture Nanoparticles

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Abstract

This study is an evaluation of the performance of mild steel coupons in developed silica nanofluid from rice husk ash. Gravimetric and electrochemical measurement methods were used for the experimental work. The chemical composition of silica was confirmed by SEM/EDS graph. The gravimetric test result shows that sample F (1.00 g/L RHA) gave the lowest corrosion rate of 1.8E−05 mm/year at 168 h. It was also observed that better protection of the material was achieved with increase in exposure time, hence lower corrosion rates. From the results of electrochemical tests, there was significant change in corrosion potential and corrosion rate with change in nanofluid concentration. Corrosion rate was positively slowed down by lower concentration of silica nanofluid. Sample C (0.25 g/L RHA) revealed the lowest instantaneous corrosion rate of 0.02876 mm/year. Silica nanofluid developed from rice husk ash may be better suited for cutting mild steel than the conventional cutting fluid.

References

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