

Abstract

Nano-sized particle incorporation into metal matrix has gained worldwide acceptance. Al_2O_3 , Cr_2O_3 , and SiO_2 nanoparticles have been co-deposited with Zn using electrodeposition process to produce advanced alloy. The coatings were characterized using SEM/EDX and XRD. The mechanical properties of the coatings were studied using microhardness indenter and dry abrasive wear tester. Zn-10 g/L Cr_2O_3 nanocomposite exhibited the highest microhardness of 228 HVN; Zn-5 g/L Al_2O_3 nanocomposite possessed the highest corrosion resistance and lowest wear loss. Zn-5 g/L SiO_2 nanocomposite showed good stability against other composite coatings. The incorporation of the Al_2O_3 , Cr_2O_3 , and SiO_2 shows grain refinement and modify orientation on Zn matrix.