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SYNTHESIS AND EVALUATION OF ZNO NANOPARTICLES AND STUDYING ITS INFLUENCE ON THE ANTIMICROBIAL, ANTICORROSION AND MECHANICAL BEHAVIOUR OF POLYURETHANE COMPOSITE FOR SURFACE COATING

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Zinc oxide nanoparticles (ZnO NPs) were obtained by a direct precipitation method. The TEM photograph demonstrated that the synthesized ZnO NPs were of a pseudo-spherical shape and the average diameter of the particles is 20.0 nm. ZnO polyurethane nanocomposite (ZPN) coating films were fabricated by uniformly dispersing ZnO NPs in varying loading levels 0.1 to 2.0 wt. % in commercial two component polyurethane by ultrasonication. The antimicrobial activity of ZPN coating films was screened against Gram-negative and Gram-positive bacteria. Corrosion performance, physical and mechanical properties of ZPN coating films was evaluated. The resulting perfect dispersion of ZnO NPs in polyurethane coating was revealed by SEM. The results showed slowdown of the growth of organisms on the ZPN coating surface and also showed an improvement in the corrosion resistance, mechanical resistance at lower concentration, and this improvement increases with increase ZnO NPs wt.%.

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