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# Phosphating Technique: A Reliable Approach for Corrosion Resistance of A36 Mild Steel

- Chapter
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## Abstract

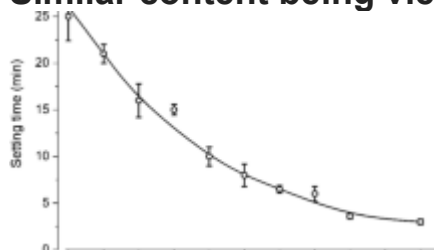
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Metals like zinc, aluminium and mild steel that serve as components in the industries tend to suffer from various forms of corrosion even at current times. It becomes a necessity to prevent these metals from corroding. An easily used technique to do this is the phosphating technique. In this paper, coatings on A36 mild steel via phosphating technique were studied in a bath that contained  $H_3PO_4$  solution with calcium oxide, zinc oxide, zinc nitrate, sodium

nitrate, sodium saccharin and distilled water. The concentration of zinc used was 5.2 g/L in total and varied concentration of locally prepared calcium oxide from calcined particles which involved periwinkle shell particles. Coating temperatures considered in this paper were 40 °C and 60 °C. Physical observation of the coated mild steel was evaluated where the best coating condition with temperature at 60 °C revealed a rough surface in crystalline and homogenous texture on the A36 mild steel. Coatings at 40 °C showed mostly smooth surface texture with mere homogenous form. SEM (scanning electron microscopy) analysis was considered to determine the morphology of the coatings on the mild steel. This viewed the best condition of coating that produced corrosion resistance. Coated mild steels with crystalline coatings homogeneously spread across the mild steel surface were seen as coatings of higher resistance. The morphology in finer form with no gaps revealed also best coatings and highest corrosion resistance. The SEM analysis revealed coating conditions on the mild steel to be at coating time of 50 min in a phosphating bath consisted of 2.5 g/L calcium additive. The coating temperature was at 60 °C. The XRF (X-ray fluorescence) analysis showed chemical compositions in the calcined particles of calcium source. The compositions of elements in the mild steel were also recorded. In addition, the best coating condition was revealed at coating temperature of 60 °C with coating time at 50 min. The concentration of calcium in the bath was revealed to be at 2.5 g/L.

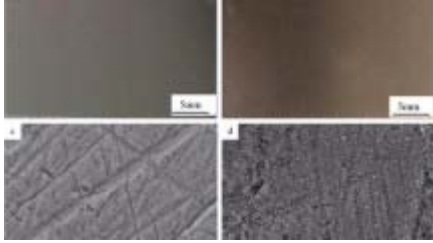
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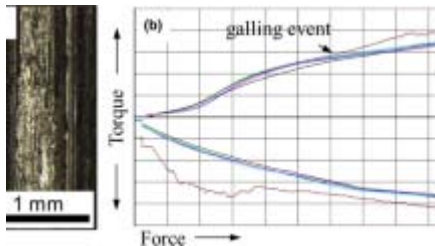
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