

PO3045

**Influence of the electrodeposition current regime on the Corrosion Behavior of Zn and Zn-TiO<sub>2</sub> Composite coatings**Shahnaz SIAD<sup>1</sup>, Hana TOUHAMI<sup>2</sup>, Abdelouahad CHALA<sup>2</sup>, Saida MARMI<sup>2</sup><sup>1</sup>University of Mohamed Khider, Biskra, Algeria <sup>2</sup>University of Biskra, LPCMA Laboratory, Biskra, Algeria

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This study report the influence of the current regime on the corrosion behavior of Zn & Zn-TiO<sub>2</sub> composite coatings using both direct and pulse current electrodeposition techniques in acidic zinc sulphate solution. The electrodeposition process was carried out, in direct current at  $i = 57 \text{ mA/cm}^2$ , and in pulsed current at (1, 10, 50) Hz and a duty cycle (25 %, 50 %, 75 %) respectively, at a minimum current density of and high current density of  $57 \text{ mA/cm}^2$ . Pure zinc coatings obtained under the same experimental conditions were used as a reference. Corrosion resistance properties of the coatings were studied using both of potentiodynamic polarisation techniques and weight loss measurements in 3.5 % NaCl solution. The study revealed that both of potentiodynamic and weight loss measurement shows that good corrosion behavior of the coatings was obtained at low frequencies and low duty cycle. The addition of TiO<sub>2</sub> nanoparticles in the plating bath renders the Zinc deposit more resistant to generalized corrosion and leading to reduction in the current by half. Best results were obtained at  $f = 10 \text{ Hz}$  and a duty cycle = 25 %.

**Keywords**electrodeposition  
coating  
composite  
corrosion  
current regime