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Data Article

# Data on the optimized sulphate electrolyte zinc rich coating produced through in-situ variation of process parameters

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ABSTRACT

In this study, a comprehensive effect of particle loading and optimised process parameter on the developed zinc electrolyte was presented. The depositions were performed between 10–30 min at a stirring rate of 200 rpm at room temperature of 30 °C. The effect of coating difference on the properties and interfacial surface was acquired, at a voltage interval between 0.6 and 1.0 V for the coating duration. The framework of bath condition as it influences the coating thickness was put into consideration. Hence, the electrodeposition data for coating thickness, and coating per unit area at constant distance between the anode and cathode with depth of immersion were acquired. The weight gained under varying coating parameter were acquired and could be used for designing and given typical direction to multifunctional performance of developed multifacetal coatings in surface engineering application.



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**Specification Table**

| | |
|---|---|
| Subject area | *Materials Engineering* |
| More specific subject area | *Surface Science and Engineering* |
| Type of data | *Table, image* |
| How data was acquired | The deposition took place in a constructed electrodeposition sequence cell containing five steps according to the principle of electrolytic co-deposition route from pre treatment to post treatment. The coating thickness, weight gained, coating per unit area were measured using coating thickness gauge and weighing balance for the weight gain. The coating per unit area was obtained from the calculated value of the coating thickness for each value of deposited matrix. |
| Data format | Raw, Analyzed |
| Experimental factors | The particles were measured appropriately and electrolyte pH was obtained before the deposition was done and required data acquired. |
| Experimental features | The depositions were performed between 10–30 min at a stirring rate of 200 rpm at room temperature of 30 °C. The effect of coating difference on the properties and interfacial surface was acquired, at a voltage interval between 0.6 and 1.0 V for the coating duration. The framework of bath condition as it influences the coating thickness was put into consideration. |
| Data source location | Department of Chemical, Metallurgical and Materials Engineering, Tshwane University of Technology, Pretoria, South Africa and Mechanical Engineering, Covenant University, Ota Ogun State, Nigeria |
| Data accessibility | Data are available within this article |

**Value of the data**

- The given data will show author in the field of surface science the correlation and effect between the zinc electrolyte and the continuous metal matrix induced electrolyte in a given engineering component.
- The data obtained for the zinc electrolyte can be used as inference to determine the anomalous metal matrix co-deposition coating for other intended nano-particle coating.
- The data can be used to examine the relationship between the process variable for instance (voltage and time) as it affect the nature of coating properties produced.
- The data could be used at investigating the coating progression between the coating thickness, weight gain and the surface area of adsorbed deposits
- The data obtained can be used in investigating the strengthening behaviour of particulate in an electrolyte relating to its mechanical characteristics.

## 1. Data

The coating thickness, weight gained, coating per unit area at constant distance between the anode and cathode with depth of immersion were collected and a unique set of experimental frame work data were generated. The depositions process was performed between 10 and 30 min at a stirring rate of 200 rpm at ambient temperature of 30 °C. The data acquired from spectrometer analysis of the mild steel is presented in Table 1. The coating depositions was run twice on two separate mild steel substrate from single electrolyte for all set of sample matrix to ascertain its deposition. The variable coating thickness, weight gained, coating per unit area were each acquire twice and the average taken as representative data for better precision. Also, data showing deposited variable in term of voltage and time of deposition was gathered (see Tables 2–5).

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